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FRED'K A. CASTLE, M.D.,

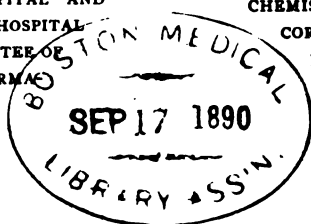
LATE PHYSICIAN TO THE PRESBYTERIAN HOSPITAL AND
LECTURER ON PHARMACOLOGY, BELLEVUE HOSPITAL
MEDICAL COLLEGE; MEMBER OF THE COMMITTEE OF
REVISION AND PUBLICATION OF THE PHARMA-
COPEIA OF THE U. S. OF AMERICA.

EDITOR

CHARLES RICE, Ph.D.,

CHEMIST OF THE DEPARTMENT OF PUBLIC CHARITIES AND
CORRECTION; CHAIRMAN OF THE COMMITTEE OF
REVISION AND PUBLICATION OF THE PHARMA-
COPEIA OF THE U. S. OF AMERICA.

ASSOCIATE EDITOR



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THE ART OF DISPENSING.

[Continued from page 226, Vol. XVII.]

Prescribers and Dispensers.

Questions of Measurements.—Prescriptions are frequently met with in which it is doubtful what size of mixture the prescriber intends. The following is an example:

R Potass. Bromidi. ʒ i.
Syr. Simpl. ʒ i.
Aque. ʒ iv.

M. ft. Sol.

Sig. One teaspoonful three times a day. DR. BLANK.

Here it is doubtful whether the physician has considered, or whether he knows, that a solid, when dissolved, will occupy a certain amount of space. This varies with almost every solid, but many substances will displace about half their weight of liquid. Does the prescriber wish the above mixture to measure five ounces and four drachms (which would be about its size if dispensed as written) or did he think an ounce-weight of bromide of potassium, when dissolved, would occupy the space of a fluidounce, and that the prescription would measure six ounces when prepared, or did he intend to call for a four-ounce mixture and forget to put the letters 'ad' (to) after the aque?

If the mixture is dispensed as it is written, it would measure forty-four drachms and the amount of bromide in each teaspoonful, assuming the teaspoon to hold only sixty minims, would be a little less than eleven grains; if a four-ounce mixture was intended, in each teaspoonful there would be fifteen grains; if five ounces was intended, there would be twelve-grain doses of the salt, and if he thought the finished mixture would measure six ounces, he would expect to get only ten-grain doses of bromide in each teaspoonful. It is often difficult to determine what to do in such a case and the difficulty is not lessened at all when the dispenser remembers that teaspoons which patients take their medicines with are not all uniform in size, and not one of them but holds more than sixty minims or one drachm, which we are taught is the regular medical teaspoonful. It will take only six of the ordinary size teaspoons to measure an ounce, so then the dose of bromide in the different sized mixtures would be twenty grains in a teaspoonful for the four-ounce mixture, sixteen grains for the five-ounce, about fourteen and one-half grains for the five and one-half-ounce, and thirteen and one-third for the six-ounce. Fortunately, it would not be serious, as far as the dose of bromide of potassium in this prescription is concerned, no matter what sized mixture is prepared, as this salt is generally given in much larger doses than any here mentioned, but the dispenser is always right when he dispenses a prescription exactly as it is written, as long as he is not sure there has been an error made, or the prescription is not a dangerous one. If it is considered necessary, it would be best to see the physician before the prescription is prepared, but the dispenser should not trouble a prescriber many times to ask about his intentions in a prescription of no great moment, or he will soon be considered a captious fellow. Of course, if there is doubt about an excessive dose of any ingredient of the prescription, it is the pharmacist's duty to consult the prescriber, no matter how coolly he may expect to be received or how little satisfaction be given. As a general thing, it will be found that the intelligent practitioner is better pleased to be consulted as to a possible error on his prescription than to learn that a neglect to do so has injured his patient. In the case of such a prescription as above, the dispenser had better use his own discretion, or, better still, dispense as written than disturb the physician about such a trifling matter.

Practical dispensing requires for its satisfactory and successful prosecution a considerable versatility of talent. Discretion has to be used and judgment exercised by the dispenser; and here is where experience is of great value and enables a man to have a fund of general information which may not often be called into requisition, but yet is essential to smooth working on some particular occasion.

Every day some knowledge is gained which may not be wanted again for months; opportunities are constantly presented of making observations which will be useful at future times; they may not be wanted for months or years; again they may be needed in a few hours, and he who remembers the most of what comes under his personal observation, will gain knowledge that can never be studied from books or taught by the most learned professor. It may not always be the best to go by the bare written instructions; tact and forethought must be used, and the confidence of both the practitioner and his patient will be gained thereby.

Alteration of Prescriptions.—Always keep in mind the

rule to make no alteration in a prescription unless you are sure of the writer's sanction. Do not, of course, kill your customer for the sake of the rule. Never dispense a prescription that you fear is a dangerous one; better let it go to some other store, whose proprietor is willing to take risks on his reputation, or consult the physician. If this latter is impossible, and it is imperatively necessary to prepare the prescription (which will happen in some very rare instances) if it is possible to prepare it so it will not be dangerous, do so, but inform the prescriber as soon as possible afterward, that he may sanction your effort. When it is necessary to see the physician, make some excuse to the customer so that the prescription will be left for preparation, to be sent or called for later on. Never let the customer suspect there is anything wrong. The dispenser is the check upon the physician, and it should be the effort of both to protect each other from errors being discovered by customers. No doubt the pharmacist has the most of this to do, and is always more ready to protect the physician than the physician is to protect him; still it is far better for him to do all he can to save the physician from the result of a mistake in writing than to betray him. The question is often asked, is the dispenser justified in effecting the solution or suspension of an ingredient in a mixture which, though prescribed in an insoluble state, is yet to be given in accurate divided doses, as, for instance, when subnitrate of bismuth is prescribed in an aqueous or alcoholic mixture, should the dispenser add a viscous ingredient to suspend it? Of course, a pharmacist may have an understanding with the prescriber, and be granted the privilege of making such a change in the prescription; but unless this has been done, he should under no circumstance add any such material to the other articles. No matter how much he may be convinced that it would be impossible for the patient to measure out fixed portions of the mixture containing equal doses of the bismuth salt, and that he is doing the patient a good turn to make the mixture so thick that the powder will be suspended, and so more evenly distributed in the doses, it will be sure to bring him into trouble, for the physician will want an explanation of why he tampered with his writing to the detriment of his patient's stomach. Besides, it does not follow that the use of a viscous substance will accomplish the object sought, viz., the suspension of the bismuth, for the substance that would most likely suggest itself to the pharmacist's mind—mucilage of acacia or of tragacanth—forms with the bismuth a glutinous, almost indiffusible mass which sinks to the bottom of the bottle, and can only with great difficulty be disturbed.

Should acid be added to quinine mixtures when none have been prescribed? Emphatically, No! If the physician wished the quinine dissolved, he would have ordered the acid. It must be assumed the physician knows something of the medicines he is using, and he probably prefers, for good reasons, to omit the acid. The bitter taste of the salt or alkaloid is more intense when dissolved than when in suspension, and sometimes it agrees better without the acid with certain conditions of the stomach. Acids may be contra-indicated in many instances, as when a woman is nursing an infant, for it is apt to check the secretion of milk. All these things are well known to the physician, but the dispenser is presumably ignorant of them. Do not be hasty in concluding that a fancied error is real, and do not make the mistake of confounding your individual opinion with the dictates of common sense, as is sometimes done by many pharmacists. However, if the prescription calls for a certain amount of acid not sufficient to dissolve the quinine, the pharmacist is justified in adding enough to dissolve it, assuming the doctor had forgotten the right quantity. This prescription, written by a practitioner in a large city, has been presented to many different stores:

R Ol. Morrhuæ,
Tr. Gentian. Co.,
Syr. Prun. Virg.,
Mucilag. Acaciæ. ʒ ʒ i.

M. ft. Mist.

Sig. One teaspoonful three times a day.

DR. BLANK.

A large number of pharmacists, when preparing it, have concluded, in their individual opinion, that the physician wished an emulsion, and have effected that result, though changing the proportions of the ingredients somewhat to do so. They were wrong, and very soon heard so from the doctor; for he expected the mixture to separate, and had given directions to the patient to shake it up before using.

Is the substitution of Liq. Acidi Arseniosi justifiable in the following prescription?

R Liq. Potass. Arsenitis. ʒ i.
Liq. Hydrarg. Perchlor. (Ph. Brit.) . . . ʒ i.
Aque. ad ʒ iv.

M. ft. Mist.

Fowler's solution, being alkaline, precipitates the mercury, and there is a possibility of the patient getting the whole of it in the last dose.

The same thing may happen when Liq. Potass. Arsenit. and Liq. Strychninæ are mixed together, the alkaloid being precipitated. In both cases the acid solution of arsenic should be dispensed, and a little compound tincture of lavender added.

A note should be made upon the prescription of any change made in it by the dispenser, so that when renewed it may be prepared the same way, and thus be always uniform, that is, always have the same effect, look, taste, and smell. It is important to remember this, for the least change in appearance, odor, or taste in a prescription will at once make a patient nervous, and justly conclude that an error has been made; considerable annoyance will be given to the dispenser which may be avoided by attention to a detail like this.

Soluble substances should always be dissolved before the medicine passes into the patient's hands, when it is possible to do so, and it is well, and may be necessary, to use a little heat to accomplish this object, but this must not be done when there is more of the substance than can be retained in solution at ordinary temperature, for when the liquid cools the surplus quantity will be deposited as crystals on the side of the bottle in a condition in which it will be almost impossible for the patient to take it.

When, therefore, the solid be in excess of the solvent, it must be reduced to the finest possible state of division, and rubbed or shaken up with the liquid, and the direction to shake the bottle be added.

It would be well if physicians would remember the solubility of the solids they prescribe and to order them in the right proportion to the solvent, that they might be retained in solution at ordinary temperature; but as pharmacists cannot regulate this, their duty is to have the mixture in the most permanent condition it can be when it leaves their hands, i. e., as much, and no more, dissolved than it can retain under ordinary keeping.

The dispenser should try, however, to cultivate a feeling of confidence in the physicians with whom he is brought in contact, so as to be able to call their attention to such matters and lead them to prescribe right quantities.

Extra Doses.—In many prescriptions it is difficult to determine whether the dose ordered of certain ingredients is safe or not.

The U. S. P. gives no directions as to the dose of any of the drugs it contains. The committee on the last revision did not care to assume the responsibility of deciding doses, as there is such a large variation in many substances; for instance, iodide of potassium is generally given in doses of from 2 to 10 grains, yet 20 grains is frequently prescribed, and even 1 to 2 drachms, twice or thrice a day, have been borne by some patients; extract of belladonna is given from very small proportions of a grain up to 2 grains, yet it would not be safe to state so in the Pharmacopœia, as it might lead to carelessness on the part of some prescriber or dispenser. If the small dose only were given in the book and a larger one caused the death of a patient, the courts might feel disposed to hold the pharmacist responsible for dispensing it. Two grains of extract cannabis indica have been given every two hours, but its administration was watched by several medical men. Some physicians regularly prescribe teaspoonful doses of subnitrate of bismuth. Ordinary doses of narcotics, in some cases, cause great excitement and very large ones produce a beneficial effect, as, for instance, 10 or 20 grain doses of chloral will make some men most obstreperous, while drachm doses induce sleep. Five ounces of conium juice have been taken daily; pure hyoscyamine has been given in a dose of $\frac{1}{4}$ grain; one drachm of the tincture of Indian hemp has been given three times a day, and one-half pound of mercury has been prescribed for a dose. A physician of this city often prescribes teaspoonful doses of the tincture of digitalis. Sulphate of quinine is often prescribed in heroic doses, and as regards the salts of morphine, opium, and its preparations, it would be difficult to say where the maximum limit ends. These are a few of the prominent things, and it might be possible to go through the whole Pharmacopœia and show that, sometimes, very large quantities of each are used. The German Pharmacopœia gives a table of maximum doses of certain powerful medicines, and if the prescriber wishes to exceed the quantities there set down, he is required to mark the quantity thus (!). Some such rule should be adopted by the physicians of this country, for it is a constantly recurring difficulty to dispensers to know whether certain quantities prescribed are unusual or dangerous doses; whether the result of an error on the part of the prescriber, or intentional. The pharmacist should not be obliged to bear the responsibility of deciding whether excessive doses are safe or not. The Pharmacopœia does not assume to be a guide; prescribers entertain varying ideas respecting the potency of drugs, and, as a rule, especially if eminent in their particular line, are apt to resent the idea that their methods of prescribing should not be familiar to the dispenser.

It is not always wise to ask questions of the patient, for his suspicions will at once be excited and cannot be allayed by anything that afterward may be said, and much annoyance will thereby be caused.

Of course, judgment and tact, in *this* and all other matters, must be used, and the pharmacist who possesses these in a marked degree will be the most successful.

If the prescriber is known to be in the habit of prescribing large doses and there is a certainty that he understands what he is about, it need not trouble the dispenser very much, but if the prescription is written by a stranger, the dispenser had better have it verified by the physician before he prepares it.

Wishes of Patients.—Patients often ask that changes be made in prescriptions, especially when these have been repeatedly compounded; such as leaving out some article, or reducing or increasing the dose. The dispenser should never accede to such a request without consultation with the physician.

Patients often insist upon being informed of the ingredients in a prescription. This probably is one of the many things that is difficult for a dispenser to refuse to do, as they are often pressing in their inquiries, and it is hard, often impossible, to evade an answer. Most prescriptions are so harmless that it would seem to do no wrong to tell customers without hesitation what they contain, but you never quite know how your information may be taken, or how the prescriber will like it, as he may have an object in keeping his patients in ignorance of what they are taking; therefore, it is always best to refuse to give the desired information. They should politely be referred to the doctor.

General Directions, as a rule, are unsatisfactory, and often lead to mistakes. If the physician does not take the pains, or has forgotten, to write the directions on the prescription, the dispenser should not be blamed if an accident occurs from an excessive dose. Still it is the duty of the pharmacist, if the prescription contains enough of an active remedy to do harm, to endeavor to find out from the patient what directions have been given verbally by the prescriber.

If there have been none given, or if there appears to be a confusion in the customer's mind as to what was directed, or if he is positive of what was told him, and yet the dose is an apparently dangerous one, the pharmacist should refuse to prepare the prescription until after the physician has been consulted.

A very common habit of many pharmacists, when there are no directions on the prescription, is to cover the blank space of their label with the words "Use as directed." It is wholly unnecessary to do this, and often unwise, as it is understood by the patient that the medicine has to be taken as directed by the physician, which probably has been done verbally, or, in some instances, written on a separate piece of paper. In using up the blank space upon the label with these unnecessary words, you prevent the physician or patient from writing on it any direction, title, or designating notes which may be necessary. Complaint is constantly made by physicians as to this practice on the part of pharmacists, and it would be to the dispensers' interest to take note of it and change their practice.

Repetition of Prescriptions.—Up to a recent period, there was no law against the repetition of prescriptions as often as the patient desired, but two years ago a law was passed in New York State forbidding such a practice, in the case of opium and morphine, without the verbal or written order of the prescriber. Of course, while this is a law, it should be obeyed, but it seems to be next to impossible to be enforced, for it would entirely revolutionize a pharmacist's business, and there would be a cry against it, not only from the pharmacists, but also from the patients, that would echo loudly in the legislative halls and very soon cause its repeal. The opposite practice has been of such long duration that but few would care to try to change it. The majority of prescriptions are of such a nature that no harm can happen, no matter how often they are repeated, nor how long the patient takes them. Prescriptions for cough mixtures, or dyspeptic remedies, often are, like heirlooms, considered of great treasure in some families, being handed down from parent to children, loaned as a great favor to neighbors, friends, and acquaintances, and though possibly doing no particular good, yet not working any harm. There are some prescriptions, such as those containing arsenic, digitalis, strychnine, hydrate of chloral, opium, morphine, or other narcotics, which, either from their cumulative tendency or from their liability to engender vices on the part of the patient, may produce serious results if repeated too frequently; and it is in such cases, we believe, not alone in the interest of the patient, but also of the dispenser, that the suggestion be made to consult the physician as to their continuance. If the prescriber takes the trouble to write or designate in any way on the prescription that he does not wish it renewed, the dispenser should heed the request; for, if he should not, he takes upon himself a great responsibility which will some day lead to trouble. Where there are no such designating marks, it is a matter which each pharmacist must decide for himself, but he should always bear in mind that, in this State, if any damage occurs to the patient that can at all be traced to the repetition of the prescription, he will be placed in a defensive position at once, with the certainty that he has been working outside the law, and, in consequence, is a law-breaker.

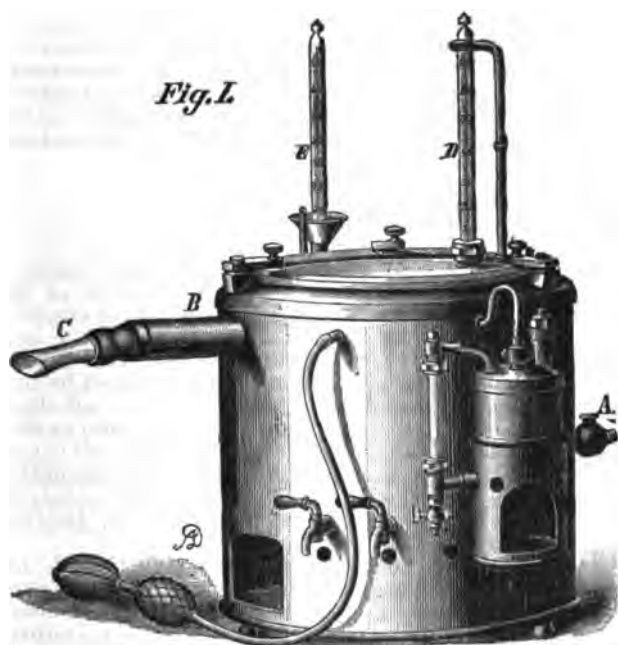
Prescription Pads are often furnished to physicians with

these words printed on: "This prescription must not be renewed without my consent." This is not binding upon the pharmacist, and does not need to be regarded any more than if they were not there, unless the physician has underscored them, so as to show that he adopts them as his own. If repeating prescriptions should cause the loss of the work of only one physician, pharmacists should hesitate and consider whether what he gains on the price of the repetitions will at all offset what he will lose by antagonizing a good prescriber. There are but a few of the many prescriptions of a store that are repeated more than three or four times, and if the customer is made to understand that the refusal to repeat is not for the purpose of causing them to pay another fee to the physician, but is for their own good, it would not take long for them to become used to the new rule.

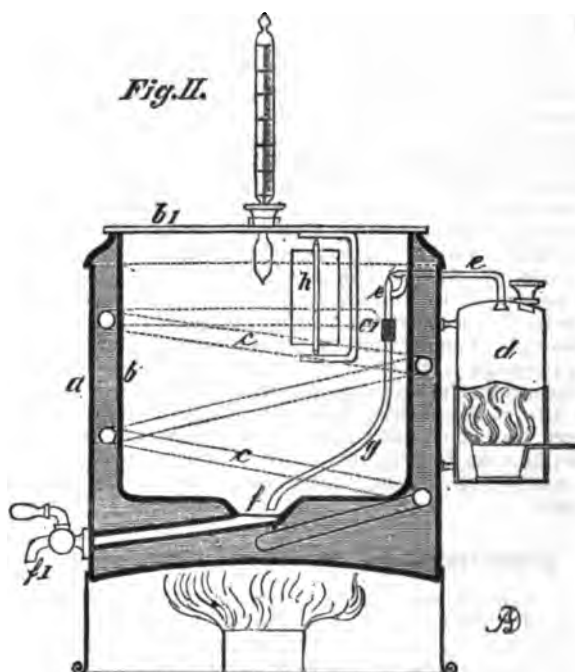
Ownership of Prescriptions.—To whom does the prescription belong? is a question that has vexed pharmacists, physicians, and patients many times. The patient considers he has paid a fee to the physician and received for it the prescription which belongs to him, as would anything else he had purchased. The pharmacist claims it as his property; it being an order upon him for certain goods, he should retain it as he does all other orders to show that his work was done correctly. The physician asserts that the prescription cannot in any sense belong to anybody but himself, for, though the patient did pay him a fee, that was not for the piece of paper that contained directions for the preparation of certain drugs, but was for the advice he gave, the skill and care used in diagnosing the case, and the knowledge he possessed of how to relieve the distress. The prescription was but a general direction to the pharmacist to give certain remedies. Often no pre-

Often customers will ask to have a prescription returned without really wishing it done, prompted to do so by an idle, transitory thought. These can usually be satisfied by a little explanation that it is necessary to keep the paper on file. Others wish to keep all their prescriptions so they may be prepared against the emergency of getting sick again; it is needless to say they invariably visit the physician again every time they are taken sick, and get a new prescription; this class can generally be satisfied with a copy. Others wish to keep the autographs of their physicians, priding themselves on the number they have collected within a period of time. Still others, from pure cussedness, and because they think the pharmacist does not wish them to have the paper, insist upon its return. These two classes will not be satisfied with any excuse the pharmacist may make, and he might as well give up the prescription at first when it is easy to do so than have to do it after an altercation of some minutes' duration, when he will receive no thanks for his action, but probably will have made an enemy of his customer.

Of course, none but the original owner of the prescription has the right to demand it or a copy of it. Often a prescription will be loaned to friends who, finding it efficacious and wishing to continue its use for a length of time, will ask the pharmacist for a copy in order to have it prepared at a nearer pharmacy. This the pharmacist has a perfect right to refuse to do if he wishes, as he is entitled to all the profits coming from its preparation after having entrusted to him, but if the original owner asks for a copy he should feel obliged to give it to him. Of course, no cast-iron rule should be made in any of these cases; it may seem desirable at times to refuse a copy of a prescription to a customer when asked for, and even take the risk of



Jahr's apparatus for inhalations.



scription is given, yet the fee would be expected just the same, or he might give verbal directions to the pharmacist and the patient thereby would have no prescription at all. It is claimed that if the patient owned the prescription he could have it repeated indefinitely even after it had ceased to be of benefit to his case.

It is probably difficult to determine just who has the best argument in this case; yet the prevailing opinion now is that the customer has the best right to the prescription, that when the physician put his directions or orders on a piece of paper and allowed it to leave his hand he lost all control over it, except as he could use his moral influence on the patient not to have it used more than once. It is the only tangible thing the patient receives for his money, and in consequence he prizes it at its full value. As to using it more than once and being damaged by doing so, that is his own risk, and he is generally willing to take that. Passing out of the customer's hands into that of the pharmacist's, with no stipulation that it shall be returned, it is the custom in this country for the pharmacist to retain it. In some countries there is no need of a stipulation for its return, for the custom is to always return the original, retaining only a copy.

This matter should be dealt with by every pharmacist in the same spirit that governs his whole business. It is very seldom that any trouble arises between the dispenser and customer on this point, and when it does, the dispenser can make up his mind that it is his own fault, and that he has failed to display tact and discretion. It is probably desirable, for the dispenser's safety, for him to retain the original paper, but there is not enough fear or danger of a mistake being charged against him for a pharmacist to be too strenuous in refusing to return the prescription, and if there should be such danger, a copy can be certified to before a notary.

losing his trade by doing so, as, for instance, a prescription containing an opiate, or an active remedy of any kind which might be hurtful if left in the customer's hand. Again, it may not always be well to refuse a copy to a person who does not own the prescription. Having once received the original prescription or a copy of it, the customer has no right to ask or demand a second copy of it. Yet there is nothing to hinder the pharmacist giving as many copies as he is asked for, if he feels so disposed.

(To be continued.)

A NEW INHALATION APPARATUS.

An improved form of inhalation apparatus has been devised by Dr. Jahr, the secretary of the German Imperial Health Department, with the object of overcoming the defects and drawbacks from which all existing inhalers appear to suffer.

One of the chief defects inherent to the latter is the irrational, or rather neglected, degree of moisture supplied with the warmed current of air to the lungs. From the observations of Valentin, Krieger, Jelinek, and Renk, it follows that there are many conditions when inhaled air, medicated or otherwise, will rather withdraw moisture from the lungs which is carried off by exhalation, than to deposit it there. Without quoting at length the author's theoretical considerations (which may be consulted in the original, published in the *Deutsche Med. Wochenschrift*), we will quote his conclusions. He says:

1. Those substances are most suited for inhalation which are easily vaporized, or those of which a notable portion may be maintained as vapor in the air, at a temperature of about 40° to 50° C. (104° to 122° F.).

2. Notable quantities of remedial agents of the nature just mentioned may be introduced by inhalation even into

diseased portions of lungs having a reduced power of aspiration, provided they are conveyed there by a current of air possessing a temperature above 37° C. (98.6° F.), and completely saturated with steam. For, if such a current of air is inhaled, a portion of the vapor or steam will become condensed in the air-passages, where its tension naturally sinks. Taking into consideration the tension of the vapor employed and the temperature at which it is used, it is possible to calculate the quantity of vapor or of medicament which is intended to be conveyed to the respiratory organs with a given volume of air.

In order to prevent the escape of the medicament from the organs, the best plan is to follow the medicated inhalation by a simple inhalation of air saturated with aqueous vapor, and possessing the temperature of the body, which is not itself capable of carrying off, as vapor, more than a trace of volatile substances. In the case of gases used for inhalation, however, the last-mentioned fact does not obtain; for both dry and steam-saturated air can dissolve the same quantity of gas.

The apparatus here described is based on the principle above outlined, viz., that air fully saturated with steam, and at a temperature above that of the body, deposits a portion of its moisture in the respiratory organs, when inhaled.

Fig. 2 shows the apparatus in section; *a* is a cylindrical boiler into which another, *b*, is so inserted that there is a space of a few centimeters between them. The interval is filled with water, which is heated to the desired temperature by a burner placed below. Between the bottoms and walls of the two boilers a coil of tubing is so inserted that one of its ends projects from the outer boiler at *A* (Fig. 1), and communicates with the air, while the other end, *c* (Fig. 2), opens into the inside boiler *b*. Opposite the orifice *c*, the wall of the outer boiler has a projecting tube, *B* (Fig. 1), likewise of double walls, and a continuation of the water-jacket formed by the two boilers. This is provided with a mouth-piece, by means of which the air, which has been heated and saturated with steam in *b*, is inhaled. The inner boiler is provided with a removable cover.

At the side of the apparatus, a small boiler is attached in which the medicinal volatile substance is vaporized so as to impregnate the air inside of the boiler *b* with it. At the same time a jet of steam, conveyed by the tube *g* from the water-jacket, aspirates the volatile vapor, saturates the air with moisture, and keeps the ventilator *b* in motion, whereby the vapors are thoroughly mixed. The water produced by condensation within the inner boiler collects in *f*, and is drawn off through a faucet.

To resume: The air enters at *A* (where it may first be passed through a filter, if desirable), then traverses the coil of tubing in the water-jacket where it becomes warmed, enters the inner boiler, becomes there saturated with moisture and remedial vapors, and is breathed from the mouth-piece at *C* (Fig. 1). Two thermometers indicate the temperature of the water and that of the interior chamber.

Deodorizing and Disinfecting Iodoform.

DR. R. JAKSCH, of Olmütz, Austria, recommends *creolin* as the most efficient agent, not only for deodorizing, but also for disinfecting it. He points out that numerous authorities have shown iodoform to be devoid of any antiseptic or parasitidal effects. Kronacher, for instance (*Münch. med. Wochensch.*, 1887, No. 29) showed that it exerts no influence at all upon the streptococcus of erysipelas or upon the bacillus anthracis. He therefore holds that iodoform, before use, should be rendered itself aseptic. Dr. Jaksch has decided in favor of "creolin" for the following reasons. In the first place, it is [reported to be] the best antiseptic known. Esmarch (*Centralbl. f. Bakteriöl.*, 1887, Vol. II.) states that it is far more energetic than carbolic acid in its action upon micrococci producing suppuration. Secondly, it is [reported to be] entirely free from any toxic effects. And lastly, only a very small quantity of it is required to deprive iodoform of its penetrating odor, not for a short time, but permanently.—After *Pharm. Post*.

Note by Ed. Am. Drugg.—Unfortunately, creolin is a proprietary article, the exact derivation of which is not exactly known, and for this reason, any reports as to its effects must be taken *cum grano salis*. Fischer has declared it to be a by-product of the carbolic acid manufacture, in which the poisonous, lower-boiling portions have been separated.

Note on Creolin.

In the foregoing paper on "Deodorizing and Disinfecting Iodoform," we had occasion to speak of creolin, pointing out that its exact composition was unknown. The following portions of an abstract printed in the *Therapeutic Gazette* of November may serve as a supplement to the former:

Dr. J. Neudörfer, of Vienna, contributes a paper to the *Med.-Chir. Centralbl.*, No. 28, 1888, on creolin (*London Medical Recorder*, Aug. 20th, 1888). He says that creolin manufacturers have a good reason for not divulging the secret of the chemical composition, in as far as it is a secret hidden from themselves. It is true that creolin does not contain a particle of carbolic acid, the test for which is extremely

sensitive; for a solution containing but one two-millionth part of carbolic acid, on being boiled with Millon's reagent (a solution of nitrate of mercury which contains nitrous acid), shows a yellow precipitate, which is dissolved in nitric acid, taking a deep red color. But though there is no carbolic acid in creolin, it would not be safe therefore to conclude that the latter is absolutely non-poisonous, since gas-tar yields many other poisonous substances besides carbolic acid, *e. g.*, aniline, fuchsine, mauvin, safranin, etc. To throw light on this subject, Neudörfer has made experiments on animals. We cannot give the latter in detail, but will give the general results and conclusions which the author arrived at:

1. Intravenous injection of the drug has a poisonous effect.

2. A dose of about 7½ grains for every 2 pounds of body weight, or of 1 C.c. (16 minims) for every 500 C.c. of blood, causes death.

3. Creolin intensely irritates the sensory, motory, and sympathetic nerves, as well as, probably, the nerve centres and ganglia.

But the danger of poisoning must not prevent the use of the drug, which, as an antiseptic, is preferable to carbolic acid, salicylic acid, iodoform, or sublimate. In a concentration of from 1 to 5 per thousand, creolin may be applied to a wound without fear of poisoning, while it does not blunt the feeling of the operator's hands, or the edge of his instruments. It has no disagreeable smell, and there is no danger of poisoning from mistaking the drug. It possesses the following positive virtues: Purulence is dried up by its touch, and it leaves on the bandages merely some yellowish-green serum. It is, therefore, a drug that circumscribes and dries up purulence, a matter of great moment to the surgeon. It further exercises a conserving effect on elements that have been formed, neither dissolving nor wrinkling them; it seems rather to render the intercellular fluid more viscous. To this property, as well as to its action on the vaso-constrictors, it owes its hæmostatic character. Much remains to be discovered as to the details of its action, but, generally speaking, it may be termed an alterative medicine, because of its effect on the sensory, motor, and sympathetic nerves, as well as, probably, the nerve-centres.

Artificial Cocaine.

PROF. C. LIEBERMANN and Dr. F. Giesel have made a most important contribution to our knowledge of the chemistry of cocaine by publishing a method for converting the amorphous secondary alkaloids found in coca leaves into pure, crystallizable cocaine. Liebermann some time ago communicated the results obtained by him in studying the nature of one of these secondary alkaloids (isatropyl-cocaine; see *Am. Drugg.*, 1888, 209), and he then announced that he had succeeded (with Dr. Giesel) in converting the troublesome and hitherto useless secondary alkaloids into pure cocaine. The following is an abstract of the author's paper, published in the *Ber. d. Deutsch. Chem. Ges.*, 1888, 3, 196:

As is well known, coca leaves, upon extraction, do not yield at once pure cocaine. The latter is always accompanied by a number of amorphous secondary alkaloids, which have to be separated before pure, crystallized cocaine can be obtained.

The nature of one of these secondary alkaloids has recently been cleared up by one of the authors of the present paper. As a general result of the preliminary studies, it was found that all the amorphous alkaloids, upon being boiled with acids, yielded the base *ecgonine*. The latter is very easily obtained by boiling the alkaloids for about one hour with hydrochloric acid, filtering off the separated acids (benzoic, etc.), evaporating the acid filtrate to dryness, and boiling the dry residue with alcohol, to remove further portions of benzoic or other acids. Pure hydrochlorate of ecgonine is left behind.

The base is set free with soda, and purified by recrystallization from alcohol. Ecgonine thus obtained was found to be absolutely identical with the ecgonine derived from crystallized cocaine.

It now became a question whether ecgonine could not be converted back into cocaine by some simple practical process. Between ecgonine and cocaine there is an intermediate base, benzoyl-ecgonine, which consists of ecgonine in combination with the benzoyl nucleus. Heretofore benzoyl-ecgonine had only been obtained either as a companion of cocaine or as a product of decomposition of the latter, but never as a synthetic product. This synthesis has now been accomplished by the authors, and the gap between ecgonine and cocaine thereby bridged over.

The problem was how to cause the benzoyl nucleus to combine with ecgonine. This was easily accomplished by means of anhydrous benzoic acid (benzoic anhydride), as well as by benzoyl chloride. The following method is given by the authors (from their patent, dated Aug. 17th, 1888):

Make a hot saturated solution of ecgonine (one molecule) in about half its weight of water, and digest it at the temperature of the water-bath for about one hour with somewhat more than one mol. of benzoic anhydride added gradually. Then set it aside. It will solidify on cooling

or standing, or while being agitated with ether, which is required to remove the excess of the benzoic anhydride added and the benzoic acid formed. The benzoyl-ecgonine which has been formed, as well as any unaltered ecgonine, are almost insoluble in ether and remain behind. The ethereal solution, upon evaporation, leaves behind all the benzoic acid used in excess. In order to obtain the synthetic benzoyl-ecgonine pure, the residue, after treatment with ether, is triturated with a very small quantity of water, and the liquid portion separated with a filter pump. Benzoyl-ecgonine remains behind, while the much more soluble ecgonine is dissolved out. If care is taken, the yield of benzoyl-ecgonine amounts to about eighty per cent of the weight of the original ecgonine. From the mother-liquids some more benzoyl-ecgonine may be obtained by evaporation. And all the unconverted ecgonine is recovered and added to the next operation.

Benzoyl-ecgonine thus obtained was found to be absolutely identical with that previously known as a decomposition product.

The conversion of benzoyl-ecgonine into cocaine had already been accomplished or at least pointed out some time ago by Einhorn. In 1885, W. Merck found that by heating benzoyl-ecgonine with iodide of methyl and methylic alcohol, in sealed tubes, the former was partly converted into cocaine. But the yield was only about 4 per cent of the amount of benzoyl-ecgonine employed. Einhorn subsequently discovered a much more simple and efficient method for converting benzoyl-ecgonine into ethylic or other compound ethers. Cocaine is, chemically, benzoyl-ecgonine-methylic ester. The method which Einhorn used to produce the ethylic ester was as follows: Make a solution of benzoyl-ecgonine in ethylic alcohol and pass dry hydrochloric acid gas into it, which will cause a considerable rise of temperature for some time. Keep on passing the gas until the liquid has become cold. Then boil it for one hour under an upright condenser, and afterwards evaporate it on a water-bath. Dissolve the residue in water, and precipitate the filtered solution with soda. The precipitate in this case was a base which differed from natural cocaine by containing the ethyl (C_2H_5) nucleus, instead of that of methyl (CH_3) which exists in true cocaine. In order to obtain the latter, it is only necessary (at least this is implied by the statements of Liebermann and Giesel) to substitute pure methylic alcohol for the ethylic, to pass dry hydrochloric acid gas through the solution and to proceed further as just described.

By this method, an extremely pure cocaine is obtained which forms magnificent crystals.

The synthetic cocaine has been tested for its physiological effects by Prof. O. Liebreich, and ascertained by him to be identical with that directly obtained from coca.

Properly speaking, the term "synthetic" cannot be applied to this artificial cocaine, since it is not possible, as yet to build it up from the elements themselves. There is every likelihood, however, that this will be eventually accomplished.

The "Gum Arabic" of the Present Market.

At a recent meeting of the Paris Pharmaceutical Society, Mr. Petit called attention to the numerous and strange varieties of gum now to be found in the market. In appearance they will pass and do sell readily for gum Arabic or gum Senegal, and, indeed, they answer for most purposes. But when the classic tests are applied to them they are quite bewildering. Alcohol, for instance, will not precipitate them when added in the usual proportion, and ferric salts will fail in many cases to produce the characteristic coagulation. Hence assays of preparations containing gum have become liable to suspicion; no analyst would like now to declare for certain that a specimen of gum syrup, for example, does not contain the quantity of gum it should. Gums reaching our markets at present have so strange a chemical behavior that new investigations on the subject are quite necessary. Mr. Marty inquired whether the ferric salt employed as reagent was not acid; it was stated in reply that perfectly neutral ferric chloride had been used, and found often to fail to coagulate solutions containing as much as 10 per cent and more of gum. Mr. Bourguetot added that he had of late examined specimens of gum with the polariscope, and noticed their refractive power was most variable and often quite different from what we were accustomed to find it. Another member suggested there was perhaps some German adulteration at the bottom of all this. But Prof. Bouchardat said the term gum is at best very vague, is applied indifferently to various substances, and nowadays when we buy "gum" we hardly know exactly what we are getting—which sentiment seemed to agree with the general feeling after listening to the discussion.—*Chem. and Drugg.*

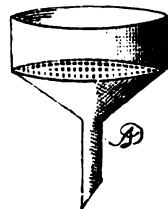
Absinthe, which was introduced into Europe by French soldiers after the Algerian war in 1844, is now one of the largest manufactures of European liquor trade, 2,000,000 gallons being made yearly in Neufchatel.

IMPROVED FUNNEL.

ON page 105 of our last volume, we described an improved funnel, proposed by Witt, into which perforated plates of glass, porcelain or other material could be introduced, so as to cause the filtering surface to present a greater area than is possible when a folded filter is laid in the funnel.

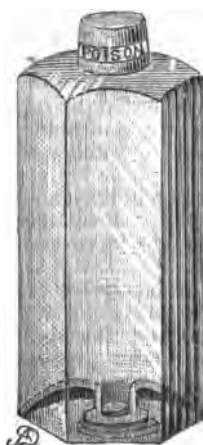
Dr. Hirsch has now introduced an additional improvement, consisting in the sides of the funnel being made straight, and the diameter of the place where the perforated plate is to rest being made larger. These funnels are made of porcelain. We would suggest that they be also made of glass, since it is always preferable to be able to watch the operation of filtration.

When these funnels are used, a sheet of filtering paper or other suitable material is laid upon the perforated disc so that the interior of the sides is also covered, for which purpose folds will have to be made in the filtering paper. If the vacuum pump is to be used, the filtering paper must be of sufficient strength to withstand the pressure. Additional support may be given to the paper by putting below it a layer of purified cotton or asbestos.

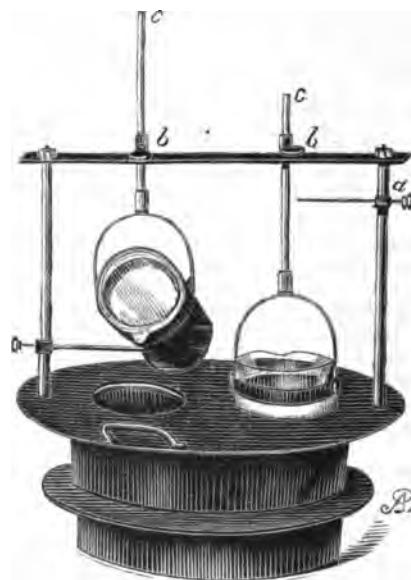


POISON BOTTLE.

THE *Chemist and Druggist* describes a bottle invented by Mr. E. S. Hermes, which is intended to be of blue glass with a fluted back. The special feature of the bottle is the fact that its top is its bottom—a sort of materialized Irish bull, as it were. What resembles the neck of the



Poison bottle.



Support for beakers.

bottle is really a dummy; the opening being in the bottom, as shown in the illustration. It strikes us as quite "English" to invent a bottle with the outlet so situated that in the event of the stopper being loose the contents will readily escape. It is quite evident that the bottle being empty, it will then be impossible for any one to be poisoned by what it doesn't contain.

SWINGS FOR BEAKERS.

WHEN beakers are immersed or placed over a water- or steam-bath, there is no difficulty in wiping their exterior surface rapidly before pouring out the contents, so that the adhering moisture or water cannot contaminate the contents. But when the beakers had been immersed in a glycerin- or oil-bath, the operation of cleaning and wiping the outside is inconvenient and tedious. To remedy this drawback, Max Kaehler has devised a sort of collar and swing, by means of which beakers may be held in such baths, or supported over them. The construction will be understood by examining the cut. As will be seen, the beakers may be raised or lowered by means of rods passing through sockets with set-screws, and may be kept in an oblique condition—for the purpose of allowing the adhering liquid to drain off—by means of the lateral rods *a, a*.—After *Chem. Zeit.*

Syrup of Phosphate of Iron.—A syrup containing less acid than former preparations and less liable to give a precipitate when diluted is suggested by R. Wright: Place in a flask 360 grains of iron wire; 6 fl. oz. syrupy phosphoric acid of s.g. 1.50; and 9 fl. oz. distilled water. Close the flask with a plug of cotton-wool and dissolve the contents with heat. Filter into 72 fl. oz. simple syrup and pass sufficient water through the filter to make the product measure 96 fl. oz.

Notes on Essential Oils.*

Oil of Bay.—The figure for spec. gravity of this oil, given by the U. S. Pharm. as 1.040, has been previously pointed out as incorrect. According to Schimmel & Co., the oil distilled by their New York house has the spec. grav. 0.9806 at 15° C.

Oil of Cananga.—Though ylang-ylang oil is derived from *Cananga odorata*, yet it is evident that the place of growth and perhaps other conditions greatly influence the properties of the essential oil of this plant. In the Philippine Islands, the oil produced from it possesses the well-known exquisite odor. That distilled from the plant grown in India, on the other hand, has a much less agreeable odor, so much so that it can only be used by soap-makers.

Oil of Orange.—The practical test of distinction between the oil of bitter and that of sweet orange, is the taste, for which purpose a sample of the oil of bitter orange of known purity should be accessible.

Oil of Eucalyptus and Eucalyptol.—It will be remembered that there has been, for some years past, a difference of opinion between Schimmel & Co., of Leipzig, and some English chemists, whether eucalyptol is a constituent of the oil of *Eucalyptus amygdalina* or not. The former denied, and the latter asserted it. It has now been shown by Prof. Wallach, of Bonn, that the said oil, as now found in the market, actually contains eucalyptol. Schimmel & Co. believe that this may be due to the careless collection of the leaves, those of *E. globulus* having been mixed with the other variety. That this happens, is shown by the quoted testimony of an Australian expert. Steps have been taken to procure a supply of genuine leaves of *E. amygdalina*, when the question will, no doubt, be finally settled.

The eucalyptol which was formerly on the market, said to be derived from *E. amygdalina*, was produced by fractional distillation over caustic potassa, and consisted mainly of phellandren ($C_{10}H_{18}$) or eucalypten, and about 20% of eucalyptol ($C_{10}H_{18}O$). A mixture of this kind has the spec. grav. 0.809, is strongly laevogyre, and does not solidify when put into a freezing mixture. It may easily be recognized by the following reaction: Mix 1 C.c. of the oil with 2 C.c. of glacial acetic acid, and add 1 or 2 C.c. of a concentrated aqueous solution of nitrite of sodium. On gently shaking, the separated oil will congeal almost suddenly to a crystalline magma of nitrite of phellandren. Neither pure eucalyptol nor the oil of *Eucalyptus globulus* afford this reaction.

A new kind of Australian oil of Eucalyptus has been announced by Mr. Bosisto under the name of "Bosisto's Standard Test Eucalyptus-Oil." It is stated to have the spec. grav. 0.920 at 10° C., boiling point 175°–178° C., polarization 10 degrees to the right, and to be capable of dissolving 20% of salicylic acid. It is also stated to be "the unadulterated product of fresh Eucalyptus leaves" [it is not said of what species] and to yield, under proper treatment, 70% of eucalyptol of the spec. grav. 0.915 at 10° C., or 52% eucalyptol, spec. grav. 0.930 at 15° C., forming clear, colorless crystals at –14° C., and melting at –1° C.

Eucalyptol.—Schimmel & Co. announce that they have discovered, in the lowest boiling portion of crude oil of camphor, a small proportion of cineol or eucalyptol, amounting to 5 or 6 per cent of the crude oil. Oil of camphor has already furnished other very interesting or important products, the principal among which is saffrol.

Attention is drawn to the fact that the use of ordinary oil of eucalyptus in form of spray, in sick-rooms, is often excessively annoying to the persons who have to breathe this air. It affects many persons in the same manner as wood-spirit does, and it is believed that this is due to the presence of valeraldehyde. If eucalyptol is used instead, however, no such effects are noticed.

Citral and Citronellon.—A preliminary examination of certain essential oils has shown the existence of certain principles to which the discoverers, Schimmel & Co., of Leipzig, have provisionally assigned the above name.

The oil of *Backhousia citriodora*, a close relative to Eucalyptus, contains, as chief constituent, a substance apparently of the nature of an aldehyde or keton, which has an intense odor of lemons. Several other oils having similar odor were then examined, and the same constituent was found in these, though in varying quantity. Thus oil of lemon contained 6 to 8 per cent of it, the oil of citronella fruit about 30%, and oil of lemon grass a large quantity. To this body the name of citral has been provisionally assigned, and the attention of chemists has been invited to it, as it seems a promising object of study.

Citronellon is the name for the present given to a keton (or aldehyde) existing in the oil of *Eucalyptus maculata* var. *citriodora*.

Oil of Kesso.—Kesso-root, from *Patrinia scabiosaeifolia*, the Japanese representative of valerian, yields an oil which will probably turn out to answer as a substitute for oil of valerian.

Oil of Lavender.—The German government has permitted the use of this oil or of oil of rosemary, in certain pro-

portions, to cover the bad odor of the evil-smelling mixture of wood-naphtha and pyridine bases which are prescribed for denaturalizing alcohol. It is only a question of time when some radical change will have to be made in this method, as the agent for denaturalizing is repulsive in odor and injurious to health, and the aromatics previously mentioned do not fully cover the bad smell.

[The question, how to denaturalize alcohol so that it cannot practically be restored to a condition allowing its use for internal purposes, is a most important one in political economy. Various countries have tried different substances, but the latter are either too disagreeable in odor, or they may, after all, be so far separated as to render the alcohol again fit for consumption. The agent used should have as near a boiling point, and its vapor as near a tension as that of alcohol itself. It should not be precipitated on dilution, and it should impart to the alcohol such a disagreeable taste that no one would use it internally. It would be well if it had an odor, but it is not at all necessary that this should be very prominent. At all events, it should not be nauseating. If such a substance could be found, it would at once smoothen the way, in this country, to freeing alcohol used in the arts from the internal revenue tax; and moreover, it would be very profitable to the discoverer.—Ed. AM. DRUGG.]

In view of the conflicting statements regarding the physical properties of oil of lavender, which are likely to be officially defined by the German government, Schimmel & Co. state that absolutely genuine oil of lavender [not rectified] has spec. grav. 0.895 at 15° C., or 0.890 at 20° C. It is soluble in 8 parts of alcohol of 0.864 (80%) [the rectified oil is soluble in 3 parts of alcohol, sp. gr. 0.895].

On distilling 100 vol. of the crude oil, nothing passed over at 160° C., 6.5 vol. at 185°–190° C., and 78.5 vol. at 190°–250° C.; altogether 85 vol.

It is evident that no official directions regarding qualities or characteristics of essential oils should be promulgated anywhere, without consulting the large manufacturers, who alone have the requisite data necessary to characterize many of these oils, as they are put on the market.

Oil of Cochlearia.—The market contains a spurious oil, consisting of oil of rue mixed with a little oil of mustard.

Oil of Sumbul.—Sumbul root is becoming excessively scarce. In Russia it has ceased to be an article of commerce. It was formerly brought by merchants of Bokhara (Turkestan) to the annual fair at Nishni-Novgorod, but, for some years past, the absence of demand has stopped all supplies.

Oil of Cloves.—In connection with this article, Schimmel & Co. make a statement which will be received with interest. As is well-known, the German empire admits certain dutiable articles duty free, provided they are used, under proper Government control, merely for manufacturing other products, and are thereby, in themselves, rendered unfit for use. Spices belong to this class. Heretofore it has been a common practice with many distillers of essential oils (whether the raw material paid duty, or was manipulated in bond) to dispose of the exhausted material by selling it to those who used it for purposes of adulteration. This seems to have been particularly practised in Hamburg, then situated outside of the customs boundaries. The new regulations, and the absorption of Hamburg within the German custom limits, will make this nefarious practice very unprofitable, and render it almost impossible. If any spices are imported, under bond, for the purpose of distilling off the oil, they must be worked under the control of custom inspectors, and the dregs must afterwards be destroyed in the presence of the same officers.

[Query: What do some of our manufacturers do with the fully or partially exhausted dregs of spices or other aromatic articles yielding essential oils? We do not reflect upon the quality of the oils, nor do we want to be understood as believing our best firms to encourage the fraudulent practices of others. But we have been credibly informed that quite an amount of exhausted material has, off and on, been disposed of at private sale, and we only wonder what has become of it.—Ed. AM. DRUGG.]

Oil of Patchouli.—Experiments are being made in Paraguay to test the possibility of cultivating the patchouli plant. Since an acre of ground can yield as much as 1 ton per year of the leaves, its cultivation would be quite profitable. [In our judgment, patchouli could be grown to advantage in many localities of Central America.—Ed. AM. DRUGG.]

Oil of Tansy.—According to M. H. Peyraud, oil of tansy, when administered to dogs, produces a condition much resembling that of rabies. The same authority has tried the oil as a remedy or preventive of this disease. He made experiments with a number of dogs, all of which received injections impregnated with the poison of rabies. Some of the dogs had previously received injections of oil of tansy. All of those not treated with the latter died, while the others have remained well up to the time of publication of the results (eight months).

Oil of Rosemary.—According to Schimmel & Co., absolutely genuine oil of rosemary [not rectified] has the spec.

*Abstracted from "Bericht von Schimmel & Co. in Leipzig." October, 1888.

grav. 1.905 at 15° C. or 0.900 at 20° C. It requires for solution at least 12 parts of alcohol of 0.864; even this shows traces of turbidity. On distilling 100 volumes, 4.5 vol. passed over up to 170° C. and 84 vol. between 170° and 200° C.; that is, altogether, 88.5 vol. at or below 200° C.

Oil of Sandal, West-Indian.—The problem of the botanical source of the West Indian Sandal wood is likely soon to be solved, as a living plant or small tree is on the way to Europe from Venezuela.

Oil of Mustard, essential.—A statement was recently made by Paul Birkenwald (in an inaugural dissertation published at Dorpat), regarding the yield of essential oil from mustard, which shows such excessive figures that Schimmel & Co. felt compelled to announce, on the basis of their twenty-two years' experience of manufacturing the oil on very large scale, that the largest yield obtained by them was—

from Dutch mustard-seed (*Brassica nigra*) . . . 0.90%.
from Russian mustard-seed (*Sinapis juncea*) . . . 0.52%.

Oil of Ylang-ylang.—The great diversity in grades and prices of oil of ylang-ylang on the market is said to be chiefly due to the fact that some manufacturers collect only the most volatile and exquisitely-odorous portion of the oil, while others extract the oil more or less completely. The latter portions of the distillate are reported to be rather insipid or faintly odorous only. 100 parts of fresh ylang-ylang flowers furnish altogether about 1.2 parts of essential oil. The best manufacturers are said to collect only about half of this.

Menthol.—A *mentholin snuff* has been introduced, which is composed of menthol, sugar of milk, and ground coffee. It is recommended in coryza.

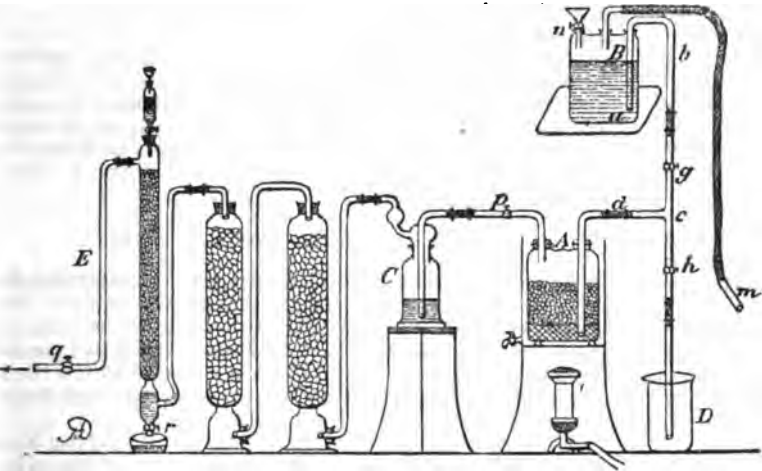
the generator as shown in the cut. At *g* and *h*, stop-cocks are inserted. *C* is a wash-bottle containing sulphuric acid. The connecting tube between this and the flask *A* is likewise provided with a stopcock *p*. The two cylinders following *C* are charged with pieces of chloride of calcium, and the last cylinder with glass-pearls moistened with sulphuric acid. Whenever necessary, fresh acid may be admitted in this cylinder through the funnel-tube above, and the waste acid drawn off below.

To start the apparatus, the stop-cocks *n* and *h* are closed, *g* is opened, and air blown into the tube *m*. This will cause hydrochloric acid to flow from *B* into *A*. When enough has entered, *g* is closed. The water-bath is now warmed to about 50° C. (122° F.), whereupon chlorine will be evolved. The gas passes through the successive wash apparatuses and issues dry and pure. When the operation is to be interrupted, the stop-cock *h* is first opened, *p* is then closed, and the warm water drawn off. If there is still development of gas, this will drive the acid contained in the flask *A* over into the receptacle *D*.

Heavy black rubber-tubing is used for all connections. The only joint which is apt to give out soon is at *d*. All connections should be fastened by copper-wire. The corks to be inserted in *A* (and elsewhere) are to be first well soaked in paraffin, and then firmly and deeply inserted. When the apparatus has been emptied of gas, all the stop-cocks are closed to prevent access of air, until it is to be started again.—*Chem. Centralbl.*

Maximum Doses of New Remedies.

DR. B. FISCHER gives (*Pharm. Zeitung*) the following maximum doses in grammes:



Vosmaer's chlorine generator.



Gay Lussac's constant-level apparatus.

CONSTANT LEVEL FOR WATER-BATH.

GAY LUSSAC'S arrangement, on the principle of a "Mariotte's Bottle," for keeping the liquid in a filter at a constant level, answers equally well for a water-bath or a water-oven, and I have so used it for several years.

The arrangement consists of a bottle, for convenience a "Winchester quart," fitted with a rubber stopper, through which pass three tubes, as shown in the figure. *A* is a long straight tube open at both ends; it passes nearly to the bottom of the vessel. *B* is a bent tube, also open, and terminates below *A*; it is intended to act as a siphon. At *B* it is bent thrice upon itself in order to prevent the heating of the column of water by convection, but when used for a water-oven the double bend is dispensed with. Tube *C* terminates inside the cork, and is opened or closed as necessity requires by means of the caoutchouc tube and glass rod *D*. The bottle is filled through *A* by means of a funnel, the plug *D* being removed whilst filling; when the plug is replaced, any further quantity of water added will run out through *B*, and when the supply of water through the funnel ceases, it will continue to flow until the level of the liquid in the water-bath *E* is at the same horizontal plane as the bottom of tube *A*. If more water be added directly to the bath, the water will rise in tube *A*; it therefore answers as a gauge of the level in the communicating vessel.—W. H. SYMONS in *Pharm. Journ.*

CHLORINE GENERATOR.

A. VOSMAER describes an apparatus for generating chlorine which has the advantage that it can be employed for a long time without recharging. The accompanying cut gives a schematic view of the arrangement.

A is the two-necked generating flask standing in a water-bath which can be heated. At the bottom of the flask is a layer of pieces of glass or pumice, and on top of this, a rather high layer (about 1½ kilo—the sizes of the flasks, etc., being adjusted to this) of the best manganese dioxide in small pieces. *B* is a reservoir for hydrochloric acid standing about 18 higher than *A*. This reservoir has 3 necks, one bearing a stoppered funnel, the second a tube *m*, and the third is connected by glass-tubing, *b c d*, with

(To be given with the utmost caution.)

	Single dose.	In 24 hours.
Hydrochlorate of Erythrophloine.....	0.01	0.03
Carbolate of Mercury.....	0.03	0.1
Formamidate of Mercury.....	0.03	0.1
Peptonate of Mercury..	0.03	0.1
Salicylate of Mercury..	0.03	0.1
Hydrobromate of Hyoscine.....	0.001	0.003
Sulphate of Hyoscyamine.....	0.001	0.003
Nitroglycerin.....	0.001	0.005
Strophanthin.....	0.0005	0.003

(To be given with caution.)

	Single dose.	In 24 hours.
Hyperosmic Acid.....	0.015	0.05
Agaricin.....	0.015	0.05
Amylene Hydrate.....	4.0	8.0
Acetanilide (antifebrin).....	1.0	8.0
Tannate of Cannabin.....	1.0	2.0
Cannabinon.....	0.1	0.3
Hydrochlorate of Cocaine.....	0.1	0.3
Guajacol.....	0.1	0.5
Hydroquinon....	0.3	1.5
Hypnon.....	0.5	1.5
Iodol.....	0.2	1.0
Osmate of Potassium....	0.015	0.05
Kairine.....	1.0	4.0
Methylal.....	4.0	8.0
Resorcin.....	8.0	10.0
Sulphate of Sparteine.....	0.03	0.1
Sulphonal.....	4.0	8.0
Sulphate of Thalline..	0.5	1.5
Tartrate of Thalline.....	0.5	1.5
Tincture of Strophanthus.....	1.5 (min.)	5.0

Cough-Medicines.—Dr. H. C. Wood, of Philadelphia, Pa., recommends as a domestic remedy four parts each of Whiskey, Paregoric, and Glycerin, and one part of Chloroform. To be shaken before using, dose a teaspoonful. Another mixture, with citrate of potassium as the active agent, consists of Potassium Citrate, ℥i.; Lemon-juice, f℥iss.; Syrup of Ipecac, f℥ss.; Paregoric, f℥iij. Enough syrup to make f℥iij. The dose is a dessertspoonful, for an adult, every 2 hours.

Paper Pulp in Pharmacy.

FILTER paper, beaten or shaken into a pulp, can be put to a variety of uses. It answers excellently as a dividing agent for oils and resinous substances in the preparation of aromatic waters, syrups, and elixirs. In the cleansing of turbid aqueous, hydro-alcoholic and saccharine liquids its applications are varied and valuable. In the preparation of aromatic waters, the results of its use surpass those obtained from the articles generally used as such, as cotton, magnesium carbonate, precipitated calcium phosphate, talc, "infusorial earth," powdered glass, silica, pumice-stone, kaolin, animal charcoal, etc. To the frequently used magnesium carbonate the objection exists that its solubility is such as to throw out of solution the salts of strychnine, morphine, etc., when dissolved in a liquid made by the intervention of this substance. Cotton neither gives good results nor is easily manipulated. Sugar and alcohol are entirely too prone to cause fermentation in medicated waters. Most of the substances named are seldom pure enough for use, while most fail to give universally good results.

Paper pulp proved to be such a desirable medium in the production of medicated waters that a trial of it in the manufacture of some aromatic syrups and elixirs naturally followed. After its repeated use, I can safely say that in purity of product, beauty of appearance, and exquisite flavor, its results are unequalled.

All torn filters, filter trimmings, and scraps of clean filter paper are saved, so that it is seldom necessary to employ entire sheets. For the vast majority of preparations ordinary filter paper will answer excellently. If an exceptional purity be required, chemically pure paper can be employed. Ordinary filter paper is often contaminated by iron, which can be removed by washing the paper first in a dilute nitro-hydrochloric acid, and then with water, until free from acid.

Paper-pulp was first employed in the manufacture of medicated waters by James Ruan.* He used 60 grains of paper and 30 minims of oil to make 2 pints of water. My experience has led to the use of 90 grains. The appended formulæ include such as have, in my experience, proven practical:—

For Anise, Caraway, Cinnamon, Fennel, Peppermint, or Spearmint water.—Take of the oil 30 minims; of filter paper 90 grains, and water to make 2 pints. Tear the paper into small pieces, put it into a quart bottle, and drop the oil thereon. Add in small portions 2 pints of water, shaking thoroughly after each addition until the paper is disintegrated. Filter, pouring back the first filtrate. When the liquid ceases to drop, carefully remove the pulp from the filter, press out the remaining liquid into the funnel again, and pour sufficient water on the filter to make 2 pints.

Camphor Water.—Take of—

Camphor.....	120 grains.
Alcohol.....	$\frac{1}{2}$ fluid ounce.
Filter paper.....	90 grains.
Water to make.....	2 pints.

Dissolve the camphor in the alcohol, pour the solution upon the shredded paper contained in a wide dish, and stir it about until the alcohol has nearly all evaporated. Then place the paper into a bottle and proceed precisely as directed above for the other aromatic waters.

To Clear Muddy Water.—In obtaining beautifully clear water for ordinary pharmacal purposes from the horribly muddy water sometimes furnished to the St. Louis consumers, the use of paper-pulp gives eminently satisfactory results.

Shake about 1 ounce of filter paper into a fine pulp, in a bottle, by the gradual adding of $\frac{1}{4}$ a gallon of water. Pour this at once in a plaited filter in a large funnel, and keep it constantly filled by fresh portions of the water. This "bed" will filter many gallons of water as clear as crystal, it matters not how muddy originally.

To filter a liquid having a finely-divided precipitate in a state of suspension, treat it just as directed for muddy water.

To Clarify Turbid Honey or Simple Syrup.—Beat 1 ounce of filter paper for each gallon of material into a pulp in a mortar, using a few ounces of water for the purpose; mix it gradually and thoroughly with the honey or syrup, and heat rapidly to the boiling point. When it has partially cooled, strain through a thick flannel cloth.

For simple syrup, the paper should be the white variety, as the boiling temperature, in connection with the use of gray paper, is liable to give the syrup a yellowish tinge.

Syrup of Tolu.—Take of:

Tincture of tolu.....	2 fluidounces.
Sugar.....	28 avoirdupois ounces.
Filter paper.....	180 grains.
Water.....	to make 2 pints.

Pour the tincture of tolu on the paper contained in a bottle, add 2 ounces of the sugar, and shake them together. Gradually add 1 pint of water, shaking well after each addition. Shake the bottle at short intervals during two hours, and then filter. When the liquid ceases to drop,

carefully remove the pulp from the filter and press the excess of liquid into the funnel again. Add the sugar, and dissolve by agitation, without the application of heat. Strain through flannel, and pour sufficient water on the strainer to make the syrup measure 2 pints.

Syrup of Ginger.—Take of:

Fluid extract of ginger.....	1 fluidounce.
Sugar.....	80 avoirdupois ounces.
Filter paper.....	120 grains.
Water.....	to make 2 pints.

Make this syrup according to the directions given for syrup of tolu.

Syrup of Orange.—Take of:

Sweet orange peel (freed from the inner white portion)....	$2\frac{1}{2}$ avoirdupois ounces.
Alcohol.....	5 fluidounces.
Sugar.....	28 avoirdupois ounces.
Filter paper.....	180 grains.
Water.....	to make 2 pints.

Macerate the orange peel in alcohol during four days; then press out the liquid and pour it into a bottle, on the paper, and continue, as in the preparation of syrup of tolu.

Compound Syrup of Squill.—To prepare this syrup follow the directions of the Pharmacopœia, except that instead of rubbing the liquid with precipitated phosphate of calcium, it is shaken up with 180 grains of filter paper, and filtered therefrom.

Elixirs, Simple or Compound.—In making any elixir, reserve two ounces of water from each pint of elixir with which to form a pulp of 60 grains of filter paper (60 grains to each pint). Add the elixir slowly, and with vigorous shaking, to the pulp mixture contained in a bottle sufficiently large to hold the entire amount. Allow it to stand for two or three days before filtering, shaking it often in the mean time.

For an elixir of salicylic acid, salicylate of sodium, or any other salicylate, the filter paper must be absolutely free from iron, or the preparation will soon become discolored. For these, chemically pure paper, or ordinary paper freed from traces of iron by means of diluted nitro-hydrochloric acid, should be used.—JOHN C. FALK in *Western Druggist*.

Alkaloids in Cod-Liver Oil.

ARMAND GAUTIER and L. Mourgues announce the discovery, in cod-liver oil, of several alkaloids, some of them of great activity, which appear to belong to the class of leucomaines, a class of alkaloidal bodies which are constantly being formed in the animal organism and which the latter is constantly endeavoring to get rid of through the secretions.

The authors examined both the colored and the bleached varieties of cod-liver oil, but they extracted the alkaloids which they studied from the bleached, as this is generally regarded the most active, and it seemed to the authors desirable to ascertain the cause of this activity.

The particular oils used by the authors were obtained directly from Newfoundland and Norway. The authors account for the presence of alkaloids in the oil in the following manner:

It is known that the fish caught under the name of cod, comprise the great cod (*Gadus morrhua*), the dorsh (*Gadus callarias*), and the small cod (*G. carbonarius*); also to a slight extent, along the coasts and bays, the *Gadus pollachius* and *G. molva*. Their livers, after being washed and placed in vats, exude spontaneously a pale yellow or pale greenish oil, which by a species of fermentation or self-digestion (not putrefaction) becomes acid, and being in contact with the hepatic cells, becomes charged with biliary matters and acquires a yellow color. At the same time also, certain alkaloids are dissolved by the oil, for that portion of the natural white or greenish oil which had previously exuded, contains none of these alkaloids, or but traces of them.

Extraction of the Alkaloids.—The process finally used by the authors is the following:

Treat 100 kilos of pale yellow cod-liver oil, with its own volume of alcohol (of 33 per cent), containing 4 Gm. of oxalic acid per liter. This treatment must be thorough. The alcoholic solution is then separated, almost exactly neutralized with chalk, filtered, and the filtrate freed from alcohol in a vacuum apparatus at a temperature of 45° C. The residue remains liquid. It is digested with precipitated carbonate of calcium, and the liquid lastly fully neutralized by a little lime-water. The whole is evaporated to dryness in the vacuum apparatus, and the residue taken up by alcohol (90%). The alcoholic solution is distilled in a vacuum, the residue taken up by a little water, super-saturated with potassa, and then shaken with a large quantity of ether, which takes up the alkaloids. These are afterwards precipitated by adding oxalic acid to the ethereal solution. From 100 kilos of cod-liver oil, between 52 and 65 Gm. of oxalates of alkaloids were obtained.

The above method removes nearly the whole of the alkaloids from the oil. On dissolving the oxalates of the latter in water and adding potassa, a brown, thick oil is obtained, of a strongly alkaline character. The yield may be stated as between 0.35 and 0.50 Gm. of dry alkaloids per kilogramme of cod-liver oil.

An examination of these alkaloids shows that they consist of volatile bases and of others which are scarcely or not at all volatile. The authors classify these bases as follows:

1. Fraction boiling between 87° and 90° C. (butylamine).
2. Fraction boiling between 96° and 98° C. (amylamine).
3. Fraction boiling a little below 100° C. (hexylamine).
4. Fraction boiling between 198° and 200° C. (hydrotoluidine; a new base).
5. Fraction of fixed bases yielding a hydrochlorate which is immediately precipitated in the cold (aselline; a new base).
6. Fraction of fixed bases, yielding a rather soluble chloroplatinate, crystallizing out from the mother-water of the preceding (morruhuine; a new base).

In addition to these bases, the authors found in cod-liver oil a little lecithine and a nitrogenized crystallizable acid, to which they have given the name *gaduinic acid*. Further reports on all the above substances are promised.—*Journ. de Pharm. et Chim.*, Oct., 1888.

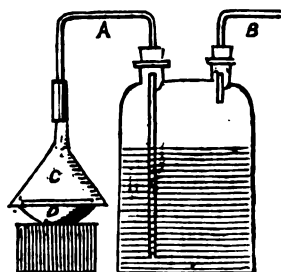
A NEW FORM OF SULPHUROUS ACID APPARATUS.

A. WOLFF's bottle, having two necks, is provided with two bent glass tubes, *A* and *B*, fitted in with corks in the usual manner. The tube *A* reaches nearly to the bottom of the bottle, the other end being attached by a short piece of india-rubber tubing to an inverted glass funnel *C*. Beneath this latter, and resting on a wood block or ring of a retort stand is a small iron dish *D*, whose diameter allows about the eighth of an inch of air space.

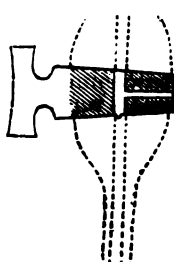
To set the apparatus in action, the bottle is two-thirds filled with water and the tubes are replaced. Fragments of sulphur are now put in the dish, lighted, and placed under the funnel, and the tube *B* connected with a filter-pump, which is put in action. By this means the SO_2 evolved is readily drawn into the water and dissolved. This method takes less time, and there is also less risk of breakage of apparatus than by that usually followed, i. e., by the decomposition of sulphuric acid, a process not altogether free from danger to the operator.—*E. RATTENBURY HODGES in Chem. News.*

IMPROVEMENT IN THE TAPS OF SEPARATING FUNNELS.

In small separatory funnels, the diameter of the tube below the tap is often so small that a column of aqueous liquid is tenaciously retained in it, but when ether passes the tap, its cohesive force is so small that the column breaks and carries with it a portion of the ethereal liquid which it may be desired to retain. If, however, a groove *G* be filed in the plug at right angles to the "way" *W*, air is admitted to the tube below whenever the tap is shut, and so any liquid it may contain runs out. The use of the tap is in other respects in no ways interfered with, provided it is always turned off in the right direction.—*W. H. SYMONS in Pharm. Journ.*, Sept. 15th.



Hodges' sulphurous acid apparatus.



Symons' improved tap.

Strophanthus Seed.

THE Pharmacopoeia Committee of the German Pharm. Association proposes the following description for *Strophanthus* seed for the next pharmacopoeia.

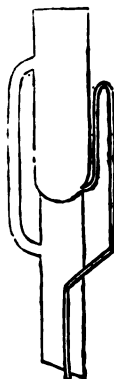
"Probably derived from *Strophanthus hispidus* D. C. and *Strophanthus Kombe* Oliver. The seeds are light, flat and lanceolate, up to 5 millimeters broad, and up to and over 15 mm. long, coated with simple, soft, whitish, yellowish, or greenish, sometimes also brownish-shining hairs, pointed at the upper end, and provided with a comose appendage. After soaking in water, the hairy seed coat, having a transparent structure permeated by very fine spiral vessels, may be stripped off. The pure-white kernel bears at its point the short radicle; the two flatly adherent, reticulated cotyledons are contained, together with the radicle, within the easily detachable endosperm. In the brownish, 10-per-cent decoction of the seed, after it has become cold, neither a precipitate nor a change of color is produced by volumetric solution of iodine, or by a solution of 0.332 Gm. of potassium iodide and 0.454 Gm. of mercuric iodide in 100 Gm. of water, or by solution of ferric chloride.—*Arch. d. Pharm.*

EXTRACTION APPARATUS.

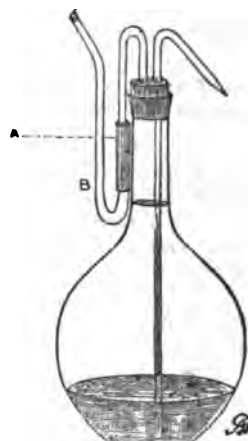
SEVERAL new forms of extraction apparatus have recently been added to the large number already introduced. One proposed by Br. Alander (*Chem. Zeit.*, 1888, 894) is shown in the accompanying cut. This has an exit-tube, which is bent up at the side high enough to cause the solid material in the extractor to be always below the level of the extracting liquid, and only the excess of it flows off into the receiving vessel. A siphoning off can only take place if the apparatus is inclined.

AN IMPROVED WASH-BOTTLE.

GEORGE W. SLATTER recently sent a communication to the *Chemical News* (1888, p. 171) in which he describes an improvement in wash-bottles, consisting in having the blowing tube, outside of the bottle, made of two parts, joined together by means of a piece of rubber tubing, which lies flat against the neck of the flask. When blowing a jet of water, the thumb of one hand is placed upon the rubber-joint, and the moment that the blowing is interrupted, the tube is compressed, thus maintaining a pressure inside of the flask for some time.



Alander's extraction apparatus.



Slatter's wash-bottle.

Solubility of Paraffin, Vaseline, etc., in Various Solvents.

B. PAWLEWSKI and **J. Filemonowicz** have determined the solubility of paraffin and other petroleum products or constituents in various solvents, and have also found a method for separating paraffin from the other bodies.

The table of solubilities given below is based upon the results obtained with an ozokerite-paraffin, having a melting point of 64-65° C., a congealing point of 61-63° C., and a specific gravity of 0.9170.

Solvent (at 20° C. = 68° F.).	1 part of Paraffin requires of the Solvent.....parts.
Carbon Disulphide.....	7.6
Benzin, boil. up to 75° C. (sp. gr. 0.7238).....	8.5
Oil Turpentine, boil. 158-166° C. (sp. gr. 0.857).....	16.1
Cumol, boil. up to 160° C. (sp. gr. 0.867).....	23.4
Cumol, boil. 150°-160° C. (sp. gr. 0.847).....	25.
Xylol, boil. 135°-143° C. (sp. gr. 0.866).....	25.1
Xylol, boil. 136°-138° C. (sp. gr. 0.864).....	22.7
Toluol, boil. 108°-110° C. (spec. gr. 0.866).....	26.1
Chloroform.....	41.3
Benzol.....	50.3
Ether (Ethyl).....	50.8
Acetone, boil. 55.5°-56.5° (sp. gr. 0.797).....	378.7
Alcohol (Ethyl), 99.5%.....	453.6
Amylic Alcohol, boil. 127°-129° (0.813).....	495.3
Methylic Alcohol, boil. 65.5°-66.5° (0.795).....	1,447.5
Glacial Acetic Acid.....	1,668.6
Alcohol (Ethyl), 94.5%.....	2,149.5
Alcohol (Ethyl), 75%.....	390,000.0

Among these solvents, glacial acetic acid is probably the most efficient and economical for separating paraffin from other petroleum products. Glacial acetic acid is a good solvent for the latter.

1 vol. of	requires of Glacial Acetic Acid, for solution. Vol.
Petroleum, commercial.....	8-16
	(in other cases.....25-60)
Petroleum residues.....	20-25

On the other hand, vaseline, ceresin, ozokerite, and paraffin are almost insoluble in glacial acetic acid. On shaking a mixture of products with a sufficient amount of the acid, the paraffin will remain undissolved.

We quote the above portion of the author's paper, as being of immediate practical value, and will only append another observation attached to the original in a foot-note, viz., that almost all commercial sorts of petroleum contain paraffin [detected by the solvent above mentioned]; and that, on distilling petroleum, paraffin passes over into the distillate already at 180°-185° C.—After *Ber. d. Deutsch. Chem. Ges.*, 1888, 2, 973.

Concentrated Aromatic Waters.

It has long been customary in Europe to prepare and keep on hand so-called Concentrated Aromatic Waters, or more correctly "Essences for preparing Aromatic Waters," for the rapid and extemporaneous preparation of any of the latter, which it may be inconvenient to keep in stock. Such concentrated waters or "essences" are prepared by dissolving the essential oils either in strong alcohol—in which case they should be called "spirits" or "essences," or in a mixture of alcohol and water. Some of these essences, when added to water in a proportion suitable for producing an aromatic water of average pharmacopoeial strength, dissolve without causing a cloudiness. Others make a more or less milky liquid, which has to be filtered with the intervention of some absorbent (as carbonate of magnesium, phosphate of calcium, talcum, paper-pulp, etc.), when the mixture in which the water is to be used is required to be clear. In other cases, it may be added without previous filtration.

The following essences are among those given by E. Dieterich in his "Pharm. Manuale," and may serve as examples for the preparation of others.

To prepare an aromatic water from these essences, take

Essence.....10 drops.*
Water.....1 fl. ounce.

1. Essence for Anise Water.

Oil of Anise.....1 part.
Alcohol (90% by vol.).....9 parts.

2. Essence for Orange Water.

Oil of Bitter Orange.....1 part.
Alcohol (90%).....20 parts.

3. Essence for Orange Flower Water.

Oil of Orange Flowers.....1 part.
Alcohol (90%).....50 parts.

4. Essence for Camphor Water.

Camphor.....4 parts.
Alcohol (90%).....6 "

5. Essence for Caraway Water.

Oil of Caraway.....1 part.
Alcohol (90%).....20 parts.

6. Essence for Lemon Water.

Oil of Lemon.....1 part.
Alcohol (90%).....9 parts.

7. Essence for Creosote Water.

Creosote.....8 parts.
Alcohol (90%).....7 "

8. Essence for Lavender Water.

Oil of Lavender.....1 part.
Alcohol (90%).....9 parts.

9. Essence for Rosemary Water.

Oil of Rosemary.....1 part.
Alcohol (90%).....9 parts.

Upon the same principle, the following essences might be kept on hand to prepare other aromatic waters official in the U. S. Ph., for instance:

10. Essence for Cinnamon Water.

Oil of Cinnamon.....1 part.
Alcohol.....6 parts.

11. Essence for Peppermint Water.

Oil of Peppermint.....1 part.
Alcohol.....9 parts.

12. Essence for Spearmint Water.

Oil of Spearmint.....1 part.
Alcohol.....9 parts.

13. Essence for Rose Water.

Oil of Rose.....1 part.
Alcohol.....50 parts.

The Drugs that Live.

THE public hospitals, dispensaries, and prisons of Paris are all supplied with drugs through the Pharmacie Centrale. Consequently the records of this establishment show the changes in the amount and kind of drugs that take place in pursuance with the progress or vagaries of modern therapeutics. MM. Bourgoni and Beurmann have studied these records of the past ten years and give some interesting facts derived therefrom. The increase in the use of antiseptics is most striking, as shown in kilograms, as follows:

	1876.	1880.	1885.
Carbolic acid.....	369	2,876	11,217
Corrosive sublimate.....	102	197	814
Iodoform.....	22	84	353
Salicylate of soda.....	0	324	353

On the other hand, the following drugs either did not increase, or fell off in amount very much: Salicylic acid, salicylate of bismuth, thymol, and permanganate of potash. As for other drugs, subnitrate of bismuth increased from 347 to 419 kilos.

* Dieterich directs only 2 drops, which we think is much too little.

Quinine increased nearly 50 per cent., but has fallen off of late, while the minor cinchona alkaloids seem to be very much more popular than they are in this country.

The amount of iron sold is on the whole about the same. Of the various preparations the ferro-potassic tartrate and the syrup of the iodide increased in amount, while the chlorides and iodides decreased. Arsenic, in almost all its forms, was dispensed in increasing amounts every year, and is a drug evidently growing in popularity in Paris.

The consumption of purgatives of various kinds was remarkably constant, both absolutely and relatively to each other. Furthermore, the amount varied little from those sold in the previous decades. So that the eleemosynary purgation of Paris seems to take place under certain very definite laws. The favorite purge is castor oil, of which over 3,000 kilos are taken yearly, which is equal to about 180,000 doses. Next in favor comes sulphate of magnesium, of which about 2,500 kilos, or 150,000 doses, are taken yearly. Third in the list is sulphate of sodium, of which the yearly consumption is about 1,500 kilos. Calceined magnesia, rhubarb, purgative salts *en bloc*, manna, senna, aloes, jalap, and scammony follow, croton-oil standing lowest in actual amount.

It would not be far from the truth to say that for the past twenty years the yearly free purgations have averaged half a million; the various salines, castor-oil, aloes, senna, rhubarb, and croton-oil being the chief agents.

Leeching has fallen off about one-half, the number of leeches used in 1876 being 50,650; in 1885, 26,320.

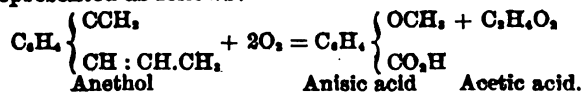
The amount of alcohol consumed increased up to 1880, but since then has decreased. The consumption of caffeine has increased greatly, but not that of tea or coffee.

Relatively the increase of chloroform sold in 1885 was greater than that of ether.

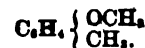
Chloral increased from 351 to 842 kilos; of the three bromides—potassic, sodic, and ammoniac—the potassium salt increased most, and the ammonium salt next, while the former is still used vastly more than any other, perhaps because it is cheaper. Opium preparations do not show much change, except that codeine has become very popular, while narceine has fallen into disuse.—*Med. Record.*

Anisic Acid as an Antirheumatic.

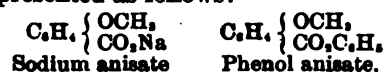
ANISIC acid is not a new substance in the field of chemistry, but it has not hitherto been used in medicine. Now, however, it is about to be introduced into therapeutics for use in diseases similar to those for which sodium salicylate has been employed. It may be prepared in at least two ways: First, by the oxidation of anise oil or anethol with nitric acid or chromic acid. The reaction is represented as follows:



It is also produced by the oxidation of para-cresol-methyl-ether:



It crystallizes from hot water in needles, and from alcohol in rhombic prisms, melting at 185° C., boiling at 280° C., and subliming undecomposed. Its salts are readily crystallizable and very soluble. The acid will be introduced into commerce chiefly as the sodium and phenol compounds represented as follows:



The latter melts at 75° or 76° C. Therapeutically, it will, as already indicated, be introduced as an antirheumatic, antineuralgic, etc. Curci recommends it to be given in the same doses as sodium salicylate. It is said to be well tolerated, to be equal in medicinal virtue to the salicylate mentioned, but destitute of the sometimes unpleasant effects of the latter.—*Chem. and Drugg.*

Oils of Lavender and Rosemary.

IN order to cover the unpleasant smell of denaturalized alcohol, the German Government has permitted the addition of oil of lavender or rosemary, which must previously be submitted to the examination of chemical experts. No official tests being prescribed by Government, Mr. H. Eckenroth recommends the following tests:

1. Lavender oil. It should be colorless or very slightly yellow, and have a specific gravity of 0.885 to 0.895. It must be miscible with 90 per cent alcohol in any proportion. 10 C.c. of the oil and 10 C.c. of alcohol of 0.895 sp. gr. should give a turbid mixture, whereas the mixture with 30 C.c. should be clear. 5 C.c. of the oil, shaken with a few grains of magenta, should remain uncolored. 90 per cent of the oil must distil below 210° C. 2. Rosemary oil. The oil must be colorless or slightly yellow. 10 C.c. of it, mixed with 15 C.c. of 90 per cent alcohol, should give a clear solution. 5 C.c., shaken with a few grains of magenta, should remain uncolored. 90 per cent of the oil must distil below 175° C.—*Chem. Zeit. and Journ. S. Chem. Ind.*

A Safe Antiseptic Solution.

DR. EMIL ROTTER, in the *Centralblatt f. Chirurgie*, some time ago again drew attention to the fact that a combination of different antiseptics is more powerful (or at least appears to be so) than any single one. He also proposed a compound antiseptic, which he claims to be very powerful, and yet not toxic to any dangerous extent. The principles upon which it was combined were the following: It should contain no poisonous agent in sufficient quantity to cause harm, if absorbed; it should be non-irritating, and easy to keep; it should be clear and free from odor; it should mix clear with ordinary water; and it should be so compounded that the essential constituents could be carried in form of powder or pastille.

The following was the result of his experiments:

	Gm.	Grains.
Corrosive Sublimate.....	0.05	1
Chloride Sodium.....	0.25	5
Carbolic Acid.....	2.00	30
Chloride Zinc.....	5.00	75
"Carbulate" Zinc.....	5.00	75
Boric Acid.....	3.00	45
Salicylic Acid.....	0.60	10
Thymol.....	0.10	2
Citric Acid.....	0.10	2
Water.....	to make 1,000,000; about 137 pints.	

This solution was tested both in the laboratory and in surgical cases. In the laboratory, it was found to have a more potent effect on pyogenic microbes than corrosive sublimate in solutions of 1 in 1,000.

Note on Phenacetin.

FROM a recent circular on phenacetin we take the following salient features:

Phenacetin, or para-acet-phenetidin, having the composition:



is a whitish, lustrous, crystalline powder, tasteless, almost insoluble in water, more easily soluble in glycerin, and readily in alcohol. It melts at 135° C., and the determination of its melting point affords a sure criterion of its purity.

During February, 1887, Prof. Kast and Dr. Hinsberg pointed out that this body was an efficient antipyretic, and this was subsequently confirmed by others. According to Dr. L. Heusner, the effects may be summarized as follows:

A dose of 1 Gm. (15 grains) of phenacetin produced in a febrile adult an energetic reduction of the temperature of the body lasting from eight to ten hours. One gramme of phenacetin has the same effect upon the temperature as $\frac{1}{2}$ gramme ($7\frac{1}{2}$ grains) of antifebrin, or 2 grammes (30 grains) of antipyrin. Doses of 1.5 grammes (22 grains) of quinine fell far short of the effect produced by these several remedies. Most patients to whom phenacetin has been administered experience a comfortable rest and inclination to sleep.

Owing to the fact that phenacetin does not produce any secondary effects, it may also be employed as an antipyretic in children, in doses of about 0.2 to 0.4 Gm. (3 to 6 grains).

Recently it has been found that phenacetin, in doses of 1 to 2 Gm. (15 to 30 grains), which may even be repeated several times daily, is a very efficient antineuralgic, acting rather slowly (after one or two hours), but surely.

The Merim Tree.

MR. JAMES W. WELLS, the well-known author of the work "Three Thousand Miles through Brazil,"* gives an account of a remarkable tree which he met on the route from Carolina, on the Rio Tocantins, to Chapada, on the Rio Grahaju. His account is as follows:

"We had spread our rugs for the morning picnic under the grateful shade of a large tree standing alone on the green slopes of the stream, and noticing that it was a stranger to my experiences (the author is a very fair botanist), I hacked off a piece of its very thick, hard, corrugated bark, and immediately a very volatile sap issued from the gash, and the piece in my hand appeared saturated with it as though it had been dipped into kerosene; its odor was very similar, and in the fire it proved equally inflammable. I took away several pieces, and some days afterwards the odor had changed to the delicate perfume of violets. I could only find that the tree is known as *Merim* (an Indian diminutive name applied to anything), although this tree was anything but small, for its lower branches were about twenty feet from the ground, and its trunk nearly five feet in circumference; its leaves were small and pinnate, and of a dark, dull-green color. The thermometer registered 83° in the shade of this tree."

In a foot-note, the author remarks: "This tree may possibly be the *sapucainha* (*Carpotroche brasiliensis*), which gives an excellent oil of a peculiar and very agreeable odor, and which must not be confounded with another *sapucainha* (*Mayna brasiliensis*) of Vellozo."

* Exploring and Travelling Three Thousand Miles through Brazil from Rio de Janeiro to Maranhão. 2 vols., 8vo., London, 1886. The above extract is from Vol. II., 248.

Solution of Albuminate of Iron.

THE Pharmacopœia Committee of the German Pharmaceutical Association proposes the following text for *Liquor Ferri Albuminati*.

Dissolve 30 parts of dry albumen in 1,000 parts of lukewarm water, strain, and pour the liquid into a mixture of 120 parts of solution of chloride of iron (Germ. Pharm., spec. grav. 1.280-1.283, equal to 10% metallic iron) and 1,000 parts of lukewarm water. To cause the separation of the iron albuminate, very dilute solution of soda is to be added in drops, if necessary, until the liquid is exactly neutral. Allow the precipitate to settle, then decant the supernatant liquid, wash the precipitate repeatedly with lukewarm water, collect it upon a moistened cloth strainer, and allow it to drain. Then transfer it to a porcelain capsule, add a mixture of 5 parts of soda solution (10%) and 50 parts of water, and promote solution by stirring. Next add 250 parts of cinnamon water (Germ. Ph.), 100 parts of alcohol (sp. gr. 0.830-0.834), and 50 parts of brandy, and dilute with enough water to make the whole weigh 1,000 parts.

The product is a clear, or but faintly turbid, reddish-brown liquid, of a scarcely perceptible alkaline reaction, tasting of cinnamon and faintly of iron, and containing about four parts of iron in 1,000 parts. Addition of solution of chloride of sodium or of hydrochloric acid precipitate it; ammonia does not affect it, and alcohol may be mixed with it without separation. On diluting the solution with water (1 in 20), it should not be rendered blue by ferrocyanide of potassium, nor should tannic acid impart to it a dark color.

From the Commentary attached to this formula by the Committee, the following portions will be of special interest to those who make or use the preparation in this country.

The preparation of albuminate of iron requires certain precautions, if a perfect product is to be obtained. It is necessary to guard against the access of chloride of sodium and still more so against that of carbonic acid. The following are the principal points which must be paid attention to. The water used for dissolving the albumen and for dilution of the iron solution must be lukewarm, but not above 50° C. In order to exclude every trace of carbonic acid, it is best to use water which has been boiled, and allowed to cool out of contact with air. The precipitated iron-albuminate must also be washed with water freed from carbonic acid. The washing itself must be continued until all the chlorine has been removed. Since the albuminate of iron will only separate when the liquid is exactly neutralized, the addition of a small amount of soda is usually necessary. It may, however, occur that the precipitate appears without the addition of soda; that is, the liquid may have attained the neutral point without it. At all events, great care is to be used not to add the slightest excess of soda, since this would exert a solvent action upon the precipitate. Hence the soda solution used for neutralizing must be very dilute (say 1 or $\frac{1}{2}$), though still reacting with very delicate litmus paper. Such litmus paper may be prepared by impregnating fine white "post" paper with a not too concentrated aqueous infusion of litmus, to which enough dilute nitric acid had been carefully added to change its color to violet, that is, intermediate between blue and red. When dry, the paper will have a pale-violet hue and will be rendered blue or red by the least trace of alkali or acid, respectively. The washed precipitate must be dissolved, without delay, in the prescribed quantity of soda solution. The whole process must be carried out quickly, at all events inside of one day, as the precipitate is liable to become less soluble by long standing. It will not do to press the precipitate upon the strainer, simple draining is required. Of the greatest importance is the quantity, quality, and mode of addition of the soda used for dissolving the precipitate. The smallest possible quantity of soda, which will effect solution, produces the clearest product. Any excess of soda will decompose the albuminate more or less, and will render it less soluble. Hence the soda must be added very dilute, and not in portions, but all at once, being immediately mixed with the precipitate by quickly stirring. The solution of soda must be as free as possible from carbonic acid and comply with all the pharmacopœial tests. In place of the dry, fresh albumen may be taken. But as the latter varies in its percentage of water, the proper quantity must be determined by experiment. Usually 75 parts of fresh albumen yield 10 parts of dry. The latter is easily prepared by passing fresh albumen through loosely woven gauze, and exposing it in thin layers, upon flat plates, either to sun-light, or to artificial (moderate) heat in a warm room, until it peels off the plate.—After Pharm. Post.

Sulphonal.—Dr. J. Fraenkel having stated in the *Berliner Klinische Wochenschrift* that he had found Riedel's sulphonal inferior to that of Bayer and that his patients had refused to take it, owing to the bitter taste which persisted long after the tablets had been swallowed. Dr. Herman Hager made a number of careful comparisons and neither he nor his assistants could discover any grounds for Dr. Fraenkel's unfavorable opinion of Riedel's sulphonal nor any perceptible difference between the two products when subjected to physiological or chemical tests.

Flicic Acid.

MALE-FERN contains several proximate principles, one of which is known to be the chief—if not sole—bearer of its therapeutic properties. This is the substance which usually deposits, in form of a crystalline precipitate, in oleoresin of male-fern on standing. As this is known to be essential to the activity of the oleoresin, the U. S. Pharmacopoeia expressly directs the deposit to be well mixed with the liquid portion, before any of it is dispensed.

If flicic acid is the only active constituent of male-fern, it will probably not be long before it is prepared and used in its pure state. To accomplish this, the process mentioned by G. Dacomo, in his recent paper on the subject of flicic acid (in *Ber. d. Deutsch. Chem. Ges.*, 1888, 2, 962), will be found serviceable. This process was first published by the author in 1887, in *Annali di Chim. e Farmacologia*, ser. IV., Vol. VI.

Mix the ethereal extract or oleoresin of male-fern with a mixture of 2 vol. of alcohol of 95% and 1 vol. of ether, and shake it thoroughly with it. The liquid will dissolve nearly everything but the flicic acid, which is left behind, in an impure state, in form of a brown, resinous, insoluble mass. This is subsequently washed with the same mixture of alcohol and ether. Next it is boiled with a little ether in a flask provided with an upright condenser, and the ether occasionally renewed, until it no longer acquires a green color. Finally, there remains a yellowish residue, which, after several recrystallizations from ether, acquires a constant melting point, viz., 179–180° C. The ether used for purifying the flicic acid can be made to yield a little more of the latter by evaporation and treatment with alcohol and ether, as before.

Thus prepared, flicic acid is a shining, pale-yellowish, crystalline powder, composed of microscopic, rhombic scales, having the melting point 179–180° C. (uncorrected). When heated over 100° C., it acquires a golden-yellow color, but resumes its original tint on cooling. It is tasteless, insoluble in water, almost insoluble in absolute alcohol, quite soluble in glacial acetic acid, ether, amylic alcohol, and toluol, crystallizing well from the three last-named solvents. It is also easily soluble in chloroform, carbon disulphide, and benzol.

Dacomo finds it to have the composition $C_{11}H_{14}O_8$, which appears to be supported by his further researches into its ultimate constitution. The latter are at present only of theoretical interest, and therefore passed over by us.

Variations in the Price of Quinine.

THE *National Druggist* gives the following tabulated statement of the price of an ounce of sulphate of quinine in this country since 1823.

Year.	Highest Price.	Lowest Price.	Year.	Highest Price.	Lowest Price.	Year.	Highest Price.	Lowest Price.
1823.	\$30 00	\$16 00	1845.	\$2 40	\$2 35	1867.	\$2 20	\$1 95
1824.	14 00	12 00	1846.	2 40	2 20	1868.	2 35	1 90
1825.	8 00	8 00	1847.	2 40	2 30	1869.	2 30	2 00
1826.	7 00	5 25	1848.	2 70	2 60	1870.	2 30	2 10
1827.	7 50	6 00	1849.	3 65	2 95	1871.	2 45	2 30
1828.	6 00	3 25	1850.	3 70	3 70	1872.	2 45	2 40
1829.	2 30	2 25	1851.	3 25	3 25	1873.	2 55	2 45
1830.	2 50	1 75	1852.	3 00	2 30	1874.	2 50	2 30
1831.	1 50	1 35	1853.	3 20	2 70	1875.	2 30	2 15
1832.	3 00	1 75	1854.	3 50	2 50	1876.	2 70	2 30
1833.	1 87	1 70	1855.	3 00	2 60	1877.	4 50	2 70
1834.	1 80	1 25	1856.	2 60	2 40	1878.	3 60	3 40
1835.	1 65	1 60	1857.	3 00	1 40	1879.	3 60	2 60
1836.	1 58	1 45	1858.	1 40	1 25	1880.	3 25	2 25
1837.	1 40	1 40	1859.	1 50	1 25	1881.	3 25	1 90
1838.	1 80	1 60	1860.	1 80	1 20	1882.	2 50	1 80
1839.	3 30	2 75	1861.	2 10	1 30	1883.	1 80	1 60
1840.	3 12	2 87	1862.	2 90	2 25	1884.	1 80	90
1841.	2 62	2 50	1863.	3 25	2 70	1885.	1 05	75
1842.	3 00	1 60	1864.	2 75	2 60	1886.	80	65
1843.	1 80	1 55	1865.	3 40	2 20	1887.	70	45
1844.	3 00	2 00	1866.	2 60	2 25	1888.	56	50

Preventing Bumping during Boiling.

In a short paper on "Bumping Ebullition" (*Chem. News*, Nov. 16th), Charles Tomlinson says:

"I have already said that these porous nuclei [for instance, capillary tubes] act by force of their capillarity, and so powerful is this force alone that it can be applied in a variety of ways. Even a short bundle of fine capillary tubes, united, like a faggot, by a thread in the middle, is an active nucleus in liberating vapor. Such a bundle, weighing only 10 grains, put into a retort, from which methylated spirit was being distilled, raised the amount of distillate in the ratio of 100 to 110.

"A Russian chemist has found that charcoal acts only for a short time in preventing bumping. This may be the case with ordinary wood charcoal, but it is not so with well-prepared boxwood charcoal, or still better with cocoanut-shell charcoal, which will continue active for hours and even days, making the boiling easy, and increasing the amount of the distillate. For example, methylated spirit, boiling at 171° F., distilled in a glass retort, gave 244 grains in five minutes; but when three or four fragments of boxwood and cocoanut charcoal, weighing together 20 grains, were added, the distillate, in five minutes, weighed 325 grains, or as 100 to 133.2."

Embalming Liquid.

ACCORDING to Leufen, the following is a good mixture:

Arsenious Acid.....	29 parts.
Bichloride of Mercury.....	30 "
Alcohol.....	200 "
Carbolic Acid Water (5%).....	3,250 "

The quantity required in the case of adults is 5 to 6 quarts. The liquid is injected, by means of a strong syringe, into the carotid artery, or the aorta, or the main arteries of the several parts of the body, until a few fine needle-pricks into the ends of the fingers and toes show that the whole body has been charged with the liquid.—*Berl. Med. Centr. Zeit.*, 1888, 575.

The Bleaching of Tincture of Litmus.

It is well known that tincture of litmus gradually loses its color when it is kept in tightly closed bottles. For this reason it is usual to stopper the litmus bottle with a pellet of cotton, or with a perforated cork through which a bent glass tube passes, or merely to invert a glass-cap over the open neck of the bottle. The cause of the bleaching has recently been made the subject of an investigation by Dubois. According to him, tincture of litmus possesses a perfect fauna and flora, consisting of infusoria, zoospores, algae, fungi, and other micrococci. The author examined three separate samples of the same tincture of litmus, each contained in a separate vessel. One of these was sterilized by mercuric chloride, another by heat, while the third was not sterilized. It was found that the sterilized samples retained their blue color completely. The other sample gradually lost its tint, and finally contained only a living, very small, globular micrococcus. The decolorization of tincture of litmus, in closed vessels, is therefore due to the presence of micro-organisms, which, when deprived of the access of air, cause a reduction of the blue coloring matter to a leuco- (or colorless) compound. If the latter is again oxidized, its blue color is restored.—*Bull. Soc. Chim. and Pharm. Post.*

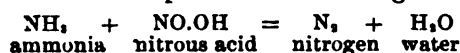
Wine from Currants.

U. S. CONSUL E. HANCOCK, at Patras, Greece, reports as follows on the industry of making wine from currants, which is assuming enormous proportions in France, owing to the great destruction of vines by the phylloxera.

The process of wine-making from dried currants is exceedingly simply. The fruit is emptied out of the barrels or sacks in which it arrives into large wooden tubs, of a capacity of several tons, and twice or thrice (according to the quality and strength of wine which it is intended to produce) the amount of water is added. During cold weather it is necessary to artificially heat the water to an average summer temperature, otherwise the fermentation would be too long delayed, but under ordinary circumstances the fermentation has taken place, and the liquid is ready to be strained in a period from eight to ten days. When this last operation has taken place, the liquid is ready for immediate use, and can in no way be distinguished from ordinary light wines; it is of a light-ruby color, and possesses a strength, according to the amount of water that has been added, of from 9 to 13 degrees. Wholesale dealers usually sell it at so much per degree of alcoholic strength. It is also employed for the manufacture of superior brands of wine, and this is done by the admixture of strong and colored Spanish, Italian, and Dalmatian wines, and by various other processes well known in France. This should not, however, cause any prejudice against similar wines, for they contain nothing deleterious or in any way injurious to the consumer, for the currant in its original state is simply a small stoneless grape, which produces an excellent, strong, fruity-flavored wine; the French, therefore, in adding water to the dried fruit are merely replacing what has been drawn out of it by the action of the sun in the process of drying. Considering how much spurious wine is put on the market nowadays, I think one has reason to congratulate himself, if he can be perfectly certain he is drinking nothing worse than the liquid produced by the admixture of currants with water. Currants are likewise consumed to a great extent during the vintage by farmers and proprietors of vineyards in France, who produce ordinary qualities of wine and who, owing to the remunerative prices paid for their wines, are anxious to increase their product as much as possible. Experience has shown them that if currants, with the usual proportion of water, are mixed during the vintage with the fresh grapes and allowed to ferment together, the blending is much superior to that obtained by mixing a currant wine to a natural wine, and the liquid obtained has all and every attribute of a pure, natural wine. The most careful chemical analyses have declared this, and it is, therefore, not to be wondered at if many wine-growers in France avail themselves of this to make up, in a small way, for the enormous deficit caused by the ravages of the phylloxera, which, if I am not mistaken, has reduced the total French wine production from an average of about 60,000,000 hectoliters of wine to about 30,000,000 annually. I may add that the 40,000 to 50,000 tons of currants annually imported into France, when turned into wine, represent only 1,500,000 hectoliters, so there is plenty of room for the further development of this trade.

Removal of Ammonium Salts from Sulphuric Acid.

In determining nitrogen by means of Kjeldahl's method—conversion of the nitrogen compound into ammonia—it is necessary to employ sulphuric acid absolutely free from salts of ammonium. This may be accomplished, according to Meldola and Moritz, by warming the acid with nitrite of potassium, about 0.05 Gm. of the latter being required for every 100 C.c. of the acid. The warming must be continued for about two and a half hours. Any ammonia present is thereby decomposed into nitrogen and water, and the excess of nitrous acid is all dissipated. The reaction which takes place is the following:



—Dingl. Pol. Jour.

Succinimide of Mercury.

This new mercurial has the formula, $\text{C}_4\text{H}_5 \left\{ \begin{smallmatrix} \text{CO} \\ \text{CO} \end{smallmatrix} \right\} \text{NH}$. and may be formed by heating together succinic acid, carbonic anhydride, and ammonia. It furnishes with mercuric oxide a compound which occurs as a white silky powder, soluble in water. This solution remains quite unchanged when kept. Dr. Vollert publishes some account of the agent in the *Therapeut. Monatshefte*. He prepared a solution of 1.3 grammes of the mercuric salt in 100 of water, and used it in a large number of cases in the form of a hypodermic injection. He found that its action was satisfactory, free from pain and from undesirable secondary symptoms. Over some similar compounds it exhibits the advantages of giving a permanent solution which may be kept without decomposition for weeks. Moreover, it is cheap; it contains about half its weight of mercury in a combined condition.—*Chem. and Drugg.*

Detection of Acetanilide.

ACCORDING TO D. Vitali (*Chem. Centralbl.*), acetanilide (antefebriin) cannot be at once detected in the urine of people who had consumed this compound. This is shown by the fact that urine, either in its original state or neutralized with ammonia, was extracted with five times its volume of ether, when the ethereal solution gave no residue. Acetanilide gives the following color reactions: A trace of it gives a blue coloration with a few drops of a solution of bleaching powder and a crystal of phenol. Mixed with a solution of potassium chlorate in sulphuric acid, it produces a red color, which is changed to yellow by water, by heating to blood red. With a crystal of potassium nitrite and a drop of concentrated hydrochloric acid, acetanilide produces a yellow color, which, on heating, changes through green to blue. On evaporation to dryness, an orange-colored residue remains, which is colored red by ammonia.

Determination of Alcohol.

THE following abstract of a paper by B. Röse, on the above subject, published in the *Zeitsch. f. angew. Chem.*, is taken from the *Journ. Chem. Soc.*

An excess of potassium permanganate oxidizes alcohol completely to carbonic acid and water when to the mixture so much concentrated sulphuric acid is added that it amounts to 40 per cent of the whole. The author's experiments were made with absolute alcohol distilled from quicklime in an apparatus from which moist air was excluded. It boiled at 78.26° C. (corr.). From this, a 1-per-cent solution was made with purified water. The permanganate solution contained 10 Gm. in a liter, and was standardized by potassium quadroxalate, a decinormal solution of which is also required. The analytical process is as follows:

About 5 Gm. of the dilute alcohol is weighed in a flask; 50 C.c. of the permanganate is run in, and then 20 C.c. of water is added, then a measured excess of the oxalate, the liquid heated nearly to boiling, and the excess of the oxalate found by permanganate. In four experiments, 100.18, 100.0, 100.24 and 100.0 per cent of the alcohol present was indicated.

New Test for Chloral or Chloroform.

A new test for either chloral or chloroform, which is said to exceed every other in delicacy, has been based by C. Schwarz upon the previously announced color reaction of chloroform with resorcin and potassa.

If a solution of resorcin is heated to boiling with chloral hydrate or chloroform, in presence of an excess of caustic soda, a red coloring matter is produced even if only the least traces of chloral or chloroform are present. This color disappears on supersaturating with acid, and reappears on addition of alkali.

On the other hand, if chloral hydrate (0.1 Gm.) or chloroform are heated to a brisk boil with an excess of resorcin (0.3 Gm.), and only a little soda solution (3 C.c. of water and 3 drops of 10% soda solution), a yellowish-red liquid is produced which shows a magnificent yellowish-green fluorescence even in the greatest dilution. The red coloring matter appears to be rosolate of sodium, while the fluorescence is due to the formation of fluoresceine. The author has obtained this color reaction with as little as 1 C.c. of a solution of 0.1 Gm. of chloral hydrate in 1 liter of

water (that is, with 0.0001 Gm. or about $\frac{1}{10000}$ grain of chloral hydrate), if the following method of procedure was adopted: In 1 C.c. of the solution just mentioned, 0.05 Gm. of resorcin were dissolved, then 5 drops of 10% soda solution added, and the whole heated to brisk boiling.

On applying this test directly to the urine of persons who have taken chloral, it was found that the color required for its appearance a protracted boiling and a considerable excess of alkali (for the decomposition of urochloralic acid). Colorless solutions may at once be subjected to the test with resorcin and soda. Colored ones, however, such as red wine, liquorice mixtures, etc., must first be decolorized.—*Zeitsch. f. anal. Chem.*, 1888, 668.

Reduction of Iodates to Iodides.

A VERY simple method for accomplishing the reduction of iodates to iodides—also of bromates to bromides and chlorates to chlorides—has been discovered by H. N. Morse and W. M. Burton. The agent by means of which the change is brought about is zinc amalgam, rich in zinc, prepared by shaking zinc dust with mercury in presence of tartaric acid, and washing with water.

The solution of the iodide containing iodate is boiled with the zinc amalgam, when the iodate is reduced, oxide of zinc being formed.

Experiments with pure iodate showed that quantities of 1 to 2 Gm. in 50 C.c. of water were completely reduced in 45 to 75 minutes, respectively.

Bromates and chlorates are also reduced by the same reagent, but with successively increased difficulty.—*After Am. Chem. Journ.*

The Constitution of Milk.

At the meeting of the French Academy of Sciences, of November 12th, M. Béchamp, of the Lille Free Faculty, presented an important memoir on the constitution of milk. Owing to the lateness of the hour, he was only allowed to give a brief outline of the results arrived at, the memoir being reserved for publication in the *Comptes Rendus*. M. Béchamp is convinced that in milk the fat-globules are not suspended as in a mechanical emulsion, but held in separate cells possessing a distinct pellicle. This is clearly proved by separating the cells and isolating the teguments, which he exhibited on a paper filter. To effect this he removed the casein with sesquicarbonate of ammonia, and gathered the fat-cells on a filter, where they were thoroughly washed and dried. Next, with a gentle heat, the fatty matter was melted out, and the cell epidermoids remained on the filter. The pellicles could easily be freed from all fat and examined. That they do not consist of casein is proved by the fact that they are soluble in alkalies, even caustic potash. The professor also held that casein is not coagulated by heat when freed from its combination with milk albumen, and it is to the latter substance that coagulation is due when it does occur.—*Chem. and Drugg.*

Resorcin as a Test for Nitrates.

DAVID LINDO, who has already pointed out the usefulness of other phenols for the detection of nitrates, finds that resorcin is a very delicate reagent.

1. *Reagents required.*—An aqueous solution of resorcin, 100 C.c. containing 10 grammes of the phenol. Solution of hydrochloric acid, about 15 per cent.

Pure concentrated sulphuric acid.

0.5 C.c. of nitrate solution, taken for each test. 1 drop of hydrochloric acid, 1 drop resorcin solution, and 2 C.c. sulphuric acid. Test-tubes $\frac{1}{4}$ inch in diameter. White background. Three or four tests made together at each dilution of nitrate.

N_2O_5 dilution.	Reaction.
1,000,000.	Faint purple, not sufficiently definite to be reliable, even after long standing.
500,000.	After some time a definite purple. Color permanent.
100,000.	At first purple-red; after an hour pronounced purple. Takes several hours to develop fully. A beautiful color and very permanent.
50,000.	After some time purple color very intense. Lower portion of band fine purple-red.
20,000.	After some time color so intense that it can only be distinctly seen in the upper portion of band by transmitted light.
10,000.	Color so intense can only be seen distinctly in the lower portion of band. Vivid purple-red.

Remarks.—Without hydrochloric acid, resorcin is not of the least value as a test for nitrates; with the addition of the acid, it is perhaps one of the best reagents we possess for the purpose. It is fully five times more delicate than carbolic acid, and the final purple color which the bands acquire is very permanent. The blank tests with distilled water, hydrochloric acid, etc., show a faint compound band, pink above, yellow below; this cannot possibly be mistaken for the definite purple band which the test gives with N_2O_5 , even at a dilution of 500,000. One drop copper solution (two per cent sulphate) added to the test was found to increase the intensity of the band, but not to a very remarkable extent; the metal may therefore be dispensed with when this phenol is employed.—*After Chem. News*, Oct. 12th.

Drug Culture in British India.

In his annual report on the Nilgiri Government Botanical Gardens, Mr. Lawson, the director of the gardens, refers to the following exotic medicinal plants which are now being grown experimentally in the gardens.

Ipecacuanha.—There are in stock altogether about 4,000 plants, 500 of which were planted out last year at Nilambur; out of these 500 three only have died, while the rest are vigorous growing plants, although they have been tapped and the leaves stripped off them no less than three times during the last nine months. About 2,000 well-rooted plants will be distributed, free of cost to planters, during the present season; the remainder will be removed for increasing still further the stock in hand. The reports on the growth of some few specimens, which were put out in the Wynaad last year, are most encouraging.

Jalap.—Between five or six thousand tubers, of all sizes, have been put down in the medicinal garden at Dodalietta, besides several thousands of cuttings; but it is not expected that any appreciable crop will be harvested before the winter of 1889 or 1890.

Medicinal Rhubarb.—Plants have been put down in the garden at Coimbatore, and others will be planted out shortly in the new garden at Gûdalûr.—*Chem. and Drugg.*

Naphthol is recommended by Dr. Ruault, of the French Laryngological Society, as an agent for removing the odor of ozena, and diminishing the discharge. The nasal passages are to be washed out three or four times daily with a large spoonful of equal parts of borate and bicarbonate of soda dissolved in a pint of water to which is added, just before use, a teaspoonful of 12 parts of naphthol in 84 parts of 90% alcohol.—*Deutsche Med. Woch.*, Oct. 25th, 1888.

Meco-narceine is reported by Dr. Laborde (*Bull. de l'Acad. de Méd.*, 1888, No. 19) to be a new alkaloid discovered by him, in conjunction with Dr. Duquesnel, in opium. He claims that it produces quiet sleep, only slight contraction of pupils, slight anæsthesia, no headache, and no disturbance of the digestive organs.

Alum is recommended by Dr. Wickstrand, of Stockholm, as the best remedy for whooping-cough. A teaspoonful of a 2-per-cent solution is to be taken from four to six times daily.—*Centralbl. f. klin. Med.*, Nov. 17th, 1888.

China Grass is recommended by Huveison as the source of a soft, silky, highly absorbent fibre used for various manufacturing purposes, and particularly well adapted for antiseptic dressings.

Cascara Sagrada.—Dr. John Irving (*Brit. Med. Jour.*, Sept. 22d, 1888) remarks that the addition of water to the liquid extract of cascara of the British Pharmacopœia makes a muddy and rather repulsive-looking draught, but that the addition of a very small quantity of ammonia water renders it clear and of a bright ruby-red by transmitted light. Other drugs may be mixed with it, provided the mixture is made alkaline by means of ammonia. Associated with iron, cascara prevents the constipating effect of that drug. Dr. Irving recommends the following formula:

Citrate of Iron and Ammonium.....30 grains.
Ammonia Water.....10 minims.
Liquid Extract of Cascara Sagrada.... $\frac{1}{2}$ to 1 drachm.
Solution of Saccharin (5 per cent).....enough to sweeten.
An Aromatic Water.....to 6 ounces.
An ounce to be taken three times a day.

Remedy for Tape-Worm.—Bernard Persh recommends: Croton Oil, gtt. i.; Chloroform, 3i.; Glycerin, 3i. To be taken in the morning, fasting, and without preliminary preparations. It is not disagreeable to take, and operates promptly.

Ointment for Acne.—Resorcin, 45 to 75 grains; Powdered Starch and Oxide of Zinc, of each 75 grains; Petrolatum, 225 grains. This ointment is to be applied at bedtime, and removed in the morning, with the aid of olive oil and cotton wadding. It never causes irritation, and improvement appears within three days.

Resins used by Ancient Egyptians.—A small jar of resin was recently submitted to Mr. E. M. Holmes for identification, it having been disinterred from a heap of rubbish found among the ruins of Naucratis, and dates from the sixth century, B.C. Naucratis was at this time the only Greek colony in Egypt, and it was through this town alone that trade with Greece was permitted. Mr. Holmes states that the jar contained Chian turpentine. According to Flückiger, there is no evidence that the old Egyptians were acquainted with the resin, and this discovery carries the history of the commerce of the drug two hundred years further back. Another resin was found on a mummy cloth on the body of a person of apparent rank. It was found in Hawara Cemetery, in the Fayum province of Lower Egypt, and dates from a period not earlier than the second century, A.D. Examination seemed to indicate that it must be a Siamese benzoin. The authors of "Pharmacographia" state that there is no evidence that Greek, Roman, or even early Arabian physicians had any acquaintance with benzoin.—*Phar. Jour.*

"Pomade Hongroise" for the moustache.—Vomacka's formula is: 100 parts each of powdered gum arabic and powdered soap; 200 parts distilled water; To be made into

a smooth paste. In another vessel mix by melting, 20 parts of spermaceti; 200 parts of yellow wax; 300 parts of distilled water. Bring the first mixture nearly to boiling and mix the two thoroughly. While still hot add 20 parts of glycerin, and add any oil chosen for perfume, drop by drop, with constant stirring.—*Nat. Drugg.*, from *Rundschau (Prag)*.

Potter's Perfect Antiseptic.—Corrosive sublimate, 5; chloride of sodium, 25; carbolic acid, 200; chloride of zinc, sulpho-carbolate of zinc, each 500; boric acid, 300; salicylic acid, 60; thymol, citric acid, each 10; water 10,000 parts. This is the author's "strong solution." Another and weaker is made by omitting the sublimate and carbolic acid. The solution is limpid, transparent, and does not affect steel instruments. He claims that it is free from the toxic properties of antiseptic fluids in common use.—*Nat. Drugg.*

"Warner's Safe Kidney Cure."—According to the information furnished to the German government and verified by the report of D. F. Homayer, of Frankfurt a. M., a government chemist, each bottle contains: Extract of *Lycopus Virginiana* (the herb), 308 grains; Extract of *Hepatica* (the herb), 232 grains; Extract of *Gaultheria*, 74 grains; Potassium nitrate, 39 grains; Alcohol (90%), 2½ ounces; Glycerin, 10 drachms. The balance is water.

Dextrin.—A Russian writer gives the following directions for making a superior quality: Mix 400 parts of potato starch with 200 parts of water and 5 parts of hydrochloric acid (s.g. 1.14) and allow it to dry. This takes about two days. Then heat gently in a water-bath for a half-hour, after which direct heat may be applied and the temperature raised to 230° F. The product is almost completely soluble in water and possesses great adhesiveness.

Chloroform perfumed with oil of cloves is said by Prof. Nussbaum to be free from liability to cause nausea when used as an anæsthetic.

Solution of Citrate of Magnesium should never be exposed to strong sunlight, as its effervescing property will be destroyed, especially when it contains much sugar.—*Br. and Col. Dr.*

Vernonin is a glucoside obtained from *Vernonia nigritiana*. It is derived from an alcoholic extract of the resin as a white, slightly hygroscopic powder, slightly soluble in ether or chloroform. Solutions are pale yellow and leave a colorless and resinous deposit which, with sulphuric acid, gives a brown color changing to violet-purple. It is reported to be a powerful cardiac poison.

Remedy for Erysipelas.—Carl Paulá, Schwimmer, and Gayza Faludi recommend the following application to erysipelas:

Carbolic acid.....3 ss.
Olive oil.....3 i.
Precipitated chalk.....q.s.

Make into a soft paste.—*Med. News.*

Lactic Acid.—Dr. Rajin, of Lyons, France, has good results from the application of an 80% solution of the acid to tuberculous ulceration and lupus. He admits the claim of Mosteg that the acid appears to destroy morbid but not healthy tissue. The application may be made twice daily. Progress is not rapid, but successful in the four cases reported.—*Boston Med. and Surg. Jour.*

Nitroglycerin.—Dr. Lautenbach, of the Pennsylvania Eye and Ear Infirmary, finds it of value in cases of tinnitus aurium accompanying cardiac lesions, and when there is little or no loss of hearing. Two doses daily of one one-hundredth of a grain each are usually sufficient, but six doses have been given. Usually improvement follows speedily, but in long-standing cases one to three months may be required.—*Med. Times.*

Thalline Tartrate.—Gillebert de Hercourt employed this in 40 cases of gonorrhœa in solution with naphthol 1 in 50 and 1 in 100; administering three injections daily. Pain diminished during micturition on the second day, and the discharge disappeared between the fourth and sixth day. It is only useful in the commencement of the disease, and fails in cases of long duration.—*Br. Med. Jour.*

Saccharin in France.—French authorities have so persistently denounced saccharin that it is surprising that those who are interested in it have not been more energetic in refuting the French statements. Certainly, there is every evidence that assertion has been greater in quantity than proof. The strongest objection which French authorities have urged against saccharin is that it cannot replace sugar as food, "because it passes through the economy and is eliminated by the urine without being assimilated or transformed." This does not appear to be a very strong reason for prohibiting the sale of saccharin in France; nevertheless, such is the case, and Portugal has recently followed suit.—*Chem. and Drugg.*

Creosote directed to be put into gelatin capsules should, according to Groh, of Vienna, be first combined with powdered cacao-butter, as it renders the capsule more stable and is better borne by the stomach.

Face Powders.—H. W. Snow, in the *New Idea*, reports the following analyses:

Freeman's "Veloutine," a powder consisting of magnesium carbonate, an insoluble silicate (French chalk), zinc oxide in considerable quantities, and bismuth subcarbonate in small amount.

Lotos' Face Powder consists of magnesium carbonate, zinc oxide, corn starch, and an insoluble silicate (talc or soapstone).

Ricksecker's Face Powder, wholly a natural, insoluble silicate, which does not have the appearance of French chalk, and is not talc.

Fellow's White Rose, chiefly French chalk, with about 25 to 30 per cent zinc oxide, perfumed with small amounts of orris root.

Eastman's Aloha Face Powder.—About equal parts zinc oxide, calcium carbonate, and starch colored with carmine, and slightly perfumed with orris.

Pinaud's Face Powder.—Zinc oxide, talc, and small quantities of starch perfumed with oil of rose.

Pinaud's Rice Powder.—Contains no powdered rice, but is composed essentially of zinc oxide, talc, corn starch, and at least one other starch, possibly from orris root.

Piesse and Lubin's Pistachio Nut Face Powder.—A fine quality of talc, elegantly perfumed, and colored slightly with a lavender tint.

Rimmel's Face Powder.—Zinc oxide, magnesia, talc, corn starch, with a vanilla perfume, probably coumarin and vanillin.

Rosaline, used to give a red tint to the nails and lips, consists of eosin, 10 parts; white wax, 30 parts; spermaceti, 30 parts; and petrolatum, 410 parts.

White-wood may be stained to resemble cedar by boiling it in a solution of 200 parts of catechu and 100 parts of caustic soda in 1,000 parts of water.

An Elegant Preparation for the Bath, it is said, may be made by thoroughly powdering and mixing 1 part of borax, 1 part of sal soda and 2 parts of salt. Alcoholic solution of oil of eucalyptus may be used to give it an odor.

Celluloid may be mended, it is said, by wetting the edges with glacial acetic acid and pressing them together for a short time.

Powdered Rosin is so liable to spontaneous combustion that Hager advises that it should be kept in tightly closed tin boxes.

Cocaine in Solution with Borax causes a precipitate, but this can be prevented by the presence of a small quantity of glycerin. When once formed the addition of the glycerin will not cause it to be redissolved. Mulberry syrup is said to have a similar effect.

Roache's Embrocation is said to consist of 2½ parts of asafoetida, digested in 60 parts of olive oil. After standing some hours it is decanted, and the solution mixed with 2 parts each of oil of caraway and turpentine and a few drops of oil of wintergreen.

Antipyrine, according to Dr. H. C. Wood, is a more successful remedy for chorea than arsenic. With the latter the average duration of treatment is 60 to 90 days. With antipyrine he has succeeded in completely arresting convulsive movements within one week.

Rhus Aromatica, the fragrant sumach of the United States, is recommended by several French doctors as a valuable remedy in cases of incontinence of urine; in atonic condition of the bladder and its sphincter. Children, 2 to 6 years old, may take 10 drops night and morning, and other children 15 drops for a dose. The tonic effect of the medicine does not always persist, but the trouble is liable to return when its use is suspended. It may be given in simple elixir.

A Drug on the Market.—The Madras Government has so much difficulty in disposing of its cinchona febrifuge (the mixed alkaloids) that it is suggested that the drug be distributed to the postmasters for sale, or given away to the poor, through the dispensaries and minor officials in malarial districts. The latter recommendation has been adopted.—*Phila. Med. Times*.

Carbonized Sawdust, saturated with certain chemical compounds, has been introduced as a material for filtering or decolorizing liquids. When the object is to remove sulphate of calcium, the chemical used is chloride of barium; for carbonate of calcium, sulphate of magnesium, and caustic soda. Sawdust intended specially for decolorization of liquids is first treated with alum and then with carbonate of sodium. This causes a precipitation of hydrate of aluminium which adheres to the sawdust. The sawdust is then washed until the wash-water does not react with chloride of barium.—*Pharm. Jour.* from *Pharm. Centralh.*, Oct. 25th.

The After-taste of Salicylates is said to be prevented by placing a small quantity of ordinary table-salt upon the tongue just before the dose of medicine is taken.

Liniment for Neuralgia.—*L'Union Médicale* gives the following formula:

Tinct. Camphor.....	90 parts.
Ether.....	30 "
Tinct. Opium.....	6 "
Chloroform.....	20 "

Apply with flannel covered with an impervious material.

Creosote.—According to Dr. J. Rosenthal (*Berlin. Klin. Woch.*), the best vehicle for creosote is carbonic acid water containing brandy. He prescribes it in bottles containing 5½, 10½, and 16 ounces. The smallest bottles contain from 1½ to 3 minims of creosote and 75 minims of brandy; the next largest, 6 minims of creosote and 3 iiss. of brandy, and the largest size 9 minims of creosote and 3 iiss. of brandy. During the first week the patient is to take one of the smallest bottles after dinner and supper each day; during the second week, half a bottle of the next stronger water after breakfast and dinner, and a weaker bottle after supper, and so on, gradually increasing the size of the dose until a maximum of 12½ minims a day is reached.

Glycerin.—Enemata and suppositories, made with 10 per cent of stearin or a hard castile soap (as mentioned in our issue for December, 1888), have been reported upon, at considerable length, in the *Medical News* for Dec. 8th, by Dr. J. P. C. Griffith, of Philadelphia, Pa. The results of experience demonstrate the opinion expressed by us that it appears to be one of the most prompt and efficient laxatives in existence, and pharmacists will do well to give the subject of the manufacture of these suppositories immediate attention.

Antipyrine.—Dr. T. H. Ross, of Buffalo, N. Y., reports a case of distention of the breast in a woman attempting to wean a child, in which 8 grains of antipyrine given thrice daily put a stop to the pain and within three days arrested the secretion of milk.—*Med. News*, Dec. 8th.

It is reported that the use of antipyrine blackens the teeth and most quickly affects those which have lost their enamel. The discoloration is only temporary and is quickly removed by oxygenated water.

Nitrous Oxide with Oxygen as Anæsthetic.—According to the *Centralbl. f. gesammte Med.*, experiments have been made in Germany on the anæsthetic effect of a mixture of four-fifths of nitrous oxide and one-fifth of oxygen, particularly in gynecology. The gas has been difficult to procure in a portable and convenient form, but the author of the paper alluded to—Swiecicki—says the mixture may be now obtained in London in the compressed condition, and very convenient for use.—*Chem. and Drugg.*

Correction in National Formulary.—In formula 241, *Liquor Zinci et Ferri Compositus*, read: "Diluted Hypophosphorous Acid," instead of "Hypophosphorous Acid." The preparation under No. 3, in the same work, is, of course, meant.

The British Pharmacopœia.—About the middle of last November, the third reprint of the British Pharmacopœia of 1885 was issued from the press. The second reprint appeared in October 1886. The original edition was of 20,000, and the reprint of 1886 of 6,000 copies. All of these have yielded to the General Medical Council a profit of 1,200l. So far as we know, the new reprint does not contain any other new features than the insertion of the synonyms "paregoric" and "paregoric elixir" under "Tinctura Opii Comphorata," and that of "laudanum" under "Tinctura Opii." The British pharmaceutical press appears to doubt the wisdom of this. For hereafter it will be an infringement of the law to sell as "paregoric" or as "laudanum" any other than the official preparations. In the case of laudanum, of which one or more "weaker" kinds were generally kept in stock for sale over the counter (for domestic or veterinary use), this will make a material difference.

Alpha-oxynaphthoic Acid as Antiseptic.—According to Magerstein, the antiseptic effect of alpha-oxynaphthoic acid is about five times as great as that of salicylic acid. The special purpose for which the experiments with this substance were undertaken was to ascertain its power of arresting, or preventing, fermentation. While 1 liter of a solution of grape sugar requires between 0.3 and 0.4 Gm. (5 to 7 grains) of salicylic acid, only 0.07 to 0.11 Gm. (about 1 to 2 grains) of alpha-oxynaphthoic acid are needed for the same purpose.

Salicylate of Mercury (C₇H₅O₂Hg) is recommended by Dr. Aurojo, of Rio Janeiro, as a preparation producing rapid effects and suitable for either internal or external use. It is a white, amorphous, odorless and tasteless powder, neutral and nearly insoluble in water or alcohol. It is fairly soluble in a watery solution of common salt, a hot saturated solution becoming gelatinous on cooling. This jelly dissolves at ordinary temperatures upon the addition of more water. Mineral acids decompose the salt, but acetic, tartaric, lactic, and carbonic acids do not.

New Chemical Laboratory at Cornell.—\$80,000 has been appropriated for building a chemical laboratory for Cornell University at Ithaca, N. Y.

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FREDERICK A. CASTLE, M.D. EDITOR.

CHARLES RICE, Ph.D. ASSOCIATE EDITOR.

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EDITORIAL.

A VERY praiseworthy, new departure is about to be inaugurated by the well-known Chicago wholesale drug-house of Morrison, Plummer & Co. It will be remembered that, at the late meeting of the American Pharmaceutical Association at Detroit, the Commercial Section passed a resolution to the effect, that manufacturers be asked to label their products, as far as possible, in accordance with the official nomenclature, to abandon unscientific and arbitrary standards, such as degrees of Baumé, "ff" marks, etc., and to express strength by figures representing specific gravity or percentage of active constituent. The firm above mentioned now announces, in *Western Druggist*, that it has adopted the above recommendation of the Association, and that it will comply with it hereafter.

We congratulate the firm on their wise resolution, and trust that it will not be long before others will follow the good example. A few manufactures, it is true, have followed this principle for years, but they are the exception, and their products are generally above the usual commercial standards, not only in quality, but also in price. The vast majority of manufacturers and of wholesale dealers in drugs and chemicals has, up to the present time, usually adhered to the old-fashioned methods.

We have for years maintained, and are more convinced than ever, that any house which will bestow the proper care upon the labels which it attaches to its products, so as to make these labels not only *commercially useful* and *correct*, but also *instructive* beyond the purely commercial aspect, will quickly feel the results in a largely increased trade. There seems to be an unwillingness, on the part of large manufacturers and dealers, to depart from long established customs. Some of these houses are so very conservative, that they even pay but little attention to the periodical changes in pharmacopœial standards, expecting that the Pharmacopœia Committees should rather fix the standards in accordance with the strength and quality of the products put by them on the market, than that their products should be accommodated and adjusted to the standards established by the Pharmacopœia. It must be said, however, that after the appearance of the *last* Pharmacopœia, manufacturers and dealers have much more readily and speedily modified their products so as to comply with the new official standards. This was chiefly

brought about by the enactment of laws, regarding the purity of food and drugs in various States, and by the public prosecution of a number of firms who had disregarded these laws.

We mention these matters merely as an illustration of the ultra-conservative spirit of the class of persons under discussion. Let the reader pick up the price-list of some manufacturer or wholesale dealer, and examine it carefully. He will, in the majority of cases—there are some very notable exceptions—find the list distinguished by various mistakes, misspellings, mis-derivations, etc., and in many cases he will be unable to tell just of what quality or strength an article may be. For instance, he will look for *aconitine*, and he will, perhaps, find a single line: "Aconitine, pure," with a price attached. On receiving a vial of it, the label will perhaps convey no further information than the price-list, and, unless he already knows something of the history of aconitine, he may remain ignorant of the risk he runs by not possessing the precise information as to the source of the alkaloid or the maker's name, which, in a case of *this* kind, stands equivalent to a quotation of the process employed. Had the vial been properly labelled, "Aconitine, cryst., Duquesnel," or "Aconitine, amorph., Merck," or "Aconitine, cryst., Gehe & Co.," etc., etc., the purchaser would obtain the very information which is absolutely necessary for him to possess. Examples of this kind might be quoted *ad infinitum*.

Certain designations, such as: "Acetic Acid, No. 8," "Ammonia, 16°," "Ammonia, f f f," "Sulphuric Acid, 66°," "Nitric Acid, 38°," etc., etc., have a commercial and conventional meaning, it is true, but they do not convey the information which, in these days of progress, we have a right to expect. The merchant may be compelled to retain these arbitrary standards, which are perhaps the only ones which many of his old customers understand. But this should not prevent him from catering to the wishes of the newer generation likewise. A single label may contain the information suitable for both. And a label of this kind can often be made very instructive, and may save the purchaser much extra time and labor. Sufficient latitude may be given to the expressions of strength, to allow for any reasonable fluctuations in different batches of one and the same product. For instance, instead of: "Acetic Acid, No. 8," a label like the following would be desirable:

ACETIC ACID.

So-called No. 8. Spec. grav. about 1.040 at 59° F. Contains about 29% of absolute Acetic Acid.

Instead of having a label "Phosphoric Acid, syrupy," or the like, something like the following is preferable:

PHOSPHORIC ACID.

Syrupy Tribasic (or Orthophosphoric) Acid, made from phosphorus. Spec. grav. about 1.700 at 59° F. Contains about 85% of absolute tribasic Phosphoric Acid (H_3PO_4).

Since all commercial syrupy phosphoric acid corresponds to this standard pretty closely, the information conveyed by the label will enable the purchaser to calculate, at once, and without hunting up tables of specific gravity and percentage in books, how much acid he will have to weigh out to make a definite quantity, say of a 50-per-cent or of a 10 per-cent phosphoric acid. It only requires the time to get up such a label *once*, and in consequence of it, the time of *every one* of the purchasers, who does not need to search through works of reference, is saved *each time* that he handles the bottle. The above examples will be sufficient to show how the plan could be carried out.

When products turned out by a firm are intended to be, as near as possible, always of uniform quality, it will be an easy matter to devise labels, after the pattern above suggested, to be used in place of the present barren ones. A firm which is willing to vouch for its products, and which actually controls and tests their purity and strength, need have no hesitation in adopting the new plan, for it is merely giving to the purchaser the figures which their own responsible analysts or assayers have verified.

IN what manner the new law about to be drafted by the State Excise Commission, for the regulation of the liquor traffic in this State, will affect the pharmacists engaged in business, should it be passed by the Legislature, cannot as yet be determined. But there can be no doubt that the

whole pharmaceutical profession of this State is most decidedly opposed to any attempt which would put them on a par with liquor-sellers pure and simple. At the same time it is certain that the profession, as a whole, would repudiate any member who should put himself on a par with a retail liquor-dealer by retailing liquors over his counter. We have watched the proceedings of the State Commission, which has now been in session for some time, with considerable interest, and believe that it has thoroughly examined the whole subject, though we apprehend that it has not always arrived at the correct results. If we are not mistaken, one of the clauses of the new law is proposed to contain a proviso that hereafter no one but a citizen of the United States shall be granted a license to sell liquor. Now, while we do not yield to anybody in patriotic feeling, and in deference and respect for the honor of American citizenship, we must say that in our opinion such a proviso as that above alluded to is not worth the paper it is written on. Citizenship is indeed an indispensable condition for many occupations, or for the exercise of certain rights, but, on examination, it will be found that all these cases have a more or less direct connection with the Government, the State, or minor political complexes, and none at all with purely personal pursuits. Thus the right to hold public office, the right to vote, the exercise of jury duty, the right to own landed property, and many other rights and privileges, may rightfully and justly be made dependent upon the possession of citizenship by the person concerned in the matter. It is easy to discover in all of these cases a connecting link between the individual and the body politic, which makes it desirable, or rather necessary, that the individual should be known as a supporter of the constitution upon which the body politic is founded. But, on the other hand, citizenship cannot be made a condition for permitting the individual to be born, to make his living, or to die. It can have nothing to do with the right of the individual to engage in business, plain and unalloyed with governmental or political relations, for the sake of making a living. A few months ago the Board of Aldermen of the City of New York attempted to pass an ordinance aimed at the thousands of Italian fruit-venders throughout the city, forbidding the granting of permits for fruit-stands to any but citizens of the United States. The legal adviser of the city very clearly and forcibly showed the unconstitutionality of this law, and it was thereupon amended so as to eliminate the objectionable section. The Board of Aldermen might just as well have passed additional ordinances forbidding any but citizens of the United States to receive licenses as peddlers, truckmen, drivers, etc. Were this kind of legislation admissible, it would not be long before it would be applied as a "protective" measure and to shut out all competition to every kind of business, whether it is carried on under a license or not. The consequence would be that there would finally remain no walk of life—except, perhaps, the lowest class of manual labor—in which a newly-arrived person could make his living, no matter how well trained he may be in a profession or trade, until he had resided in the country long enough to become a citizen. He would be like the boy who was told that he might learn to swim, but who was not allowed to go in the water.

Now, if the law to be proposed by the State Commission should contain such a clause, it will become of interest how this part of the law, taken in connection with the other sections, will affect the interests of pharmacists engaged in business, or proposing to do so. Personally we could wish that they were all citizens; but, actually, we know of quite a number who are not, most of them because they have not been in the country long enough; a smaller number from various other causes. If the new law throws pharmacists and liquor dealers together, the section about citizenship might apply to both, and its enforcement will create trouble and annoyance for some members of the profession. It is, therefore, advisable to watch the proposed legislation carefully, so that no attempt can be made to consummate the blunder.

It is not improbable that the Commission will reconsider their action on this point, and eliminate the objectionable feature from the proposed law. Perhaps this has already been done, though we have not seen it reported. The pas-

sage of the unwarrantable section can do no good, being not even able to afford a guarantee that "citizen liquor-dealers" will be more respectable and law-abiding than "alien liquor-dealers." Nay, it will only jeopardize any good that may be derived from the execution of the remaining sections of the law.

CREOLIN, the new proprietary antiseptic, which has received indorsements from Prof. Esmarch and other well-known authorities as to its efficacy and power (we hope that the indorsers will not have reason to repent), is already on the market in several brands. Besides the original Simon-pure, of Jeyes (or Pearson & Co.), there is one made and sold by A. Artmann, of Brunswick, Germany, which is advertised as being "identical with Jeyes' creolin, but free from the strong tarry odor of the latter, to be non-poisonous, not caustic, and free from carbolic acid, etc." The representatives of the genuine article take every opportunity of informing the public that the "imitation" is worthless. R. Otto some time ago published a notice regarding Artmann's creolin in the *Pharm. Centralhalle*, in which he states that this is made from the heavy fractions of coal-tar, boiling between 180°–220° C., by first distilling off the carbolic acid, and then converting the remainder into compounds with alkalies. Otto thinks that Artmann's product is preferable to the English. When mixed with water, it produces a strongly milky, faintly alkaline liquid, resembling an emulsion. [Since Otto's paper was published, Artmann has made use of Otto's report in a manner which induced the latter to publicly denounce the unauthorized use of his name.] Artmann's creolin occurs as a thickish, dark-brown, perfectly clear liquid, having an odor less disagreeable than the English product, with a spec. grav. of 1.100 at 70° C. It is soluble in alcohol, in all proportions, to a liquid free from fluorescence. On incineration it leaves 3.3% of ash, consisting chiefly of sodium sulphate, chloride, and carbonate. The milkiness which is caused by the addition of water is due to substances which may be separated from the emulsion by ether or benzol. It is not possible to dissolve them out from the creolin itself by means of these solvents. Addition of hydrochloric or sulphuric acid, and also of solution of soda, causes the milkiness of the watery emulsion to disappear. Otto states that the creolin under discussion contains about 50 per cent of phenols; also 2 per cent of carbonate of sodium.

A cursory examination of a sample of Jeyes' Creolin by one of us shows this to have a slightly alkaline reaction (about the same as that above described). It is soluble to a clear liquid in alcohol, ether, benzol, etc., and forms with water a milky emulsion; the color of it becomes the whiter the more dilute it is. This aqueous emulsion is, however, not cleared up by hydrochloric or sulphuric acid, nor by caustic soda. If Otto's statement about Artmann's creolin in this respect is correct, the behavior of the aqueous emulsion to the above-mentioned acids and alkali would afford one method of distinguishing the genuine from the imitation. The spec. grav. of the genuine was found to be 1.082 at 55° F.

According to Crismer, creolin undergoes a more or less extensive decomposition when heated in a retort. At first a little water passes over, but between 115° and 120° C. considerable quantities of hydrosulphuric acid gas are generated. The sulphur appears to exist in the creolin in combination with carbon, and not in the form of sulphates, sulphides, or phenol-sulpho-acids.

THE new and simple process by means of which the amorphous bases, extracted along with the chief alkaloid from coca leaves, can be converted into pure, crystallizable cocaine, is likely to revolutionize the whole cocaine industry. Prof. C. Liebermann and Dr. F. Giesel announced, some time ago, that they had successfully accomplished this, and an abstract of their latest communication, containing the details of their process, will be found on page 4 of this number. We learn from the authors' paper that they have patented their process. But we do not believe that the patent can be controlled, as the process does not require either any special apparatus, or any special intermediary agent or patented ingredient. Moreover, the patentee has no means of knowing whether any

cocaine sold by a manufacturer has been obtained naturally or artificially. A patent which cannot be controlled is worse than useless. It is like "a shadowy fence around a spectral fortress."

If the process of converting the hitherto useless and rejected amorphous bases into pure cocaine is as easy as the authors describe, manufacturers will no longer have any excuse for putting on the market any product from coca except the pure, crystallized alkaloid cocaine and its salts. Most manufacturers have heretofore, of their own accord, only sold the pure alkaloid and its salts, and have put aside the amorphous bases as waste by-products. These latter will no doubt now be rapidly worked up and put on the market in form of cocaine. In consequence thereof, the price of cocaine, which is already so low as to leave but little profit to the maker, will probably fall still lower, and eventually the manufacture of cocaine will be concentrated in fewer hands than at present.

THE manufacturers of sulfonal, of whom there are at present four, have issued a circular in which they announce that, to insure the purity of their product, they will hereafter subject all their output to the control of two scientific experts. At the same time they announce that they have settled upon a uniform price. We cannot help believing that the essential part of this "combine" is the "regulation of the price." The "scientific control" is a very good thing, no doubt, but we have heretofore not heard of any bad lots of sulfonal being turned out by the manufacturers, and are inclined to believe that the signature of the experts, as a sort of trade mark upon the labels, is considered of more importance than any scientific examination of the substance itself.

PAPER-PULP has for some time been employed, to a limited extent, in pharmacy, having been recommended by James Ruan, in 1874, in the manufacture of medicated waters. A recent paper by J. G. Falk, read before the Missouri Pharmaceutical Association, furnishes suggestions for its more extended use, and leads us to inquire whether wood-pulp, so extensively used in manufacture of paper, and already employed for antiseptic surgical dressings, might not be treated so as to fit it for pharmaceutical uses. If this can be accomplished, the labor of converting it into paper, and then reducing it to a pulp, would be avoided, and a considerable item of expense be done away with.

THE *Canada Lancet*, in its issue for October, p. 63, says that Dr. Bull, of Glasgow, recommends *iodized fennel* as a remedy in uterine affections. Will the editor of the *Lancet* kindly furnish us with a description of this decided novel substance?

Michigan Pharmaceutical Association.—The officers for the ensuing year are: President, George Gundrum, Ionia; Vice-Presidents, F. M. Alsdorf, Lansing; H. M. Dean, Niles, and O. Eberbach, Ann Arbor; Secretary, H. J. Brown, Ann Arbor; Treasurer, William Dupont, Detroit. Executive Committee, A. Lymann, Manistee; A. Bassett, Detroit; F. J. Wurzburg, Grand Rapids; W. A. Hall, Greenville, and E. T. Webb, Jackson.

The Antipyrine Craze in Paris.—A correspondent to the *Virginia Medical Monthly* says that the extent to which antipyrine is employed in Paris is incredible. The average French doctor prescribes it for all the ills that flesh is heir to; it has become as necessary an article in every lady's boudoir as her perfume bottle; scarcely a man can be found who has not some of it carefully stored away in his pocket-book; children are raised on it, and cry for it as for their *biberons*; and, in fact, they all take it, and for all things, but especially for *migraine*, which, as you know, is pre-eminently the malady of those who indulge in social dissipation. "That you may form an idea of the extent to which it is the rage, I will give you an incident as it was told me by the party immediately concerned: Mrs. P— was dining out recently in the Faubourg St. Germain, when she chanced to mention that she had suffered with headache during the day. Instantly, from the pockets of thirteen of the fifteen guests who were present, antipyrine was produced—in capsules, wafers, powders, and elixirs—and she was compelled to take a dose then and there, notwithstanding her earnest protest and her assurance of entire relief before starting from home.

CORRESPONDENCE.

Assay Scheme for Bismuth Ores.

Editor *American Druggist*.

DEAR SIR:—On page 217 November number AM. DRUGGIST, I gave your readers a simple test for some of the ores of bismuth in the form of making a coating of bismuth iod on charcoal. The assay for bismuth seems to be a bug-bear to the majority of pharmacists. It seems to me it would be well for all pharmacists to acquaint themselves with the study of so-called inorganic chemistry. Through this region a Ph.G. that does not understand estimation of minerals will lose a great deal as far as a monetary consideration is concerned. Now, as to our scheme for bismuth assay, we proceed as follows:—Take of ore (finely pulverized) 10 grammes, borax glass powd. 30 grammes, sodium bicarb. 10, kalium cyanide (pot. cy.) 6 grammes, salt to cover; put in medium size crucible, fuse in moderate furnace fire, and test the resulting metallic button as follows:

Dissolve button in boiling HNO₃ (filter out other metals such as tin, gold, antimony, etc.). Evaporate to nearly dryness on porcelain dish; to expel nitrous acid fumes add about 4 C.c. HCl. Heat three minutes over alcohol lamp, then put in beaker containing about one liter water; add of water q.s. to precipitate bismuth oxychloride. Let stand 12 hours, decant and filter, put precipitate in small capsule and burn to expel chlorine and form bismuth oxide. Now estimate, as in similar operation, to get percentage of the pure metal in the bismuth ox.—about 89%. If this is of any use, give it to your readers. Next time will describe process for estimation of tin, copper, etc.

Yours truly,

G. H. HERBERT.

BEAVER, UTAH, Nov. 29d, '88.

San Francisco Meeting of the A. P. A.

Editor *American Druggist*.

DEAR SIR:—In the last issue of the *National Druggist* (Dec. 15th), an announcement was made concerning the S. F. Meeting of the A. P. A. which I fear may prove misleading to the members and others who contemplate making the trip to California, not only in the dates mentioned, but also in the scheme proposed by Mr. Aglar, Agent U. P. R'y. I respectfully request that you will make the statement that the announcement made was not authorized or approved by the committee, who are now diligently at work upon the subject. When they shall have matured a plan that will meet the views of the members of the Association, and are able to give a through rate at the least possible expense, making the side excursions entirely optional, it will appear over the authority of the committee's signatures. We have been delayed somewhat in our labors by the diversity of opinion concerning the date that should be fixed upon for the meeting, which has now narrowed down to June 24th or July 15th. Members interested are urgently requested to communicate their preference to the undersigned, if possible, before January 10th, 1889. Announcement of the date and plan for the trip to California will be communicated in time to appear in the February issue of the pharmaceutical journals.

Very respectfully,

EMLIN PAINTER,

Chairman Com. on Arrangements,
Broadway and 34th St., New York.

NEW YORK, Dec. 25th.

How to Thaw Frozen Gas-Pipes.

MR. F. H. SHELTON says: "I took off from over the pipe some 4 inches or 5 inches, just a crust of earth, and then put a couple of bushels of lime in the space, poured water over it, and slaked it, and then put canvas over that, and rocks on the canvas so as to keep the wind from getting underneath. Next morning, on returning there, I found that the frost had been drawn out from the ground for nearly 3 feet. You can appreciate what an advantage that was; for picking through frozen ground, with the thermometer below zero, is no joke. Since then we have tried it several times. It is an excellent plan, if you have time enough to let the lime work. In the daytime, you cannot afford to waste the time, but if you have a spare night in which to work, it is worth while to try it."—*Sci. American*.

Talcum as a Remedy in Diarrhoea.—Deborre recommends talcum in diarrhoea. He gives usually 200 Gm. (about 7 avoirdupois ounces) of very finely powdered talcum in twenty-four hours, sometimes even double the quantity. The talcum is mixed, just previous to its administration, with a sufficient quantity of an aromatic liquid or milk. It does not produce discomfort in the bowels, or nausea, and causes a cessation even of very severe diarrhoea in from two to three days. The remedy is, however, without effect in chronic diarrhoea, prevalent in the tropics, or in that form which is caused by tubercular ulceration.—*Pharm. Centralt.*

The physicians of Alsace-Lorraine have been forbidden to write prescriptions in French. They must use either Latin or German.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,259.—Sulphurares (Boston).

We have never seen this term in English, but believe it is an anglicized form of a term not long ago introduced by Louis Olivier, to designate certain organisms occurring only in sulphuretted waters, such as *leptothrix*, *bacillus zooglæus*, etc. These contain sulphur, which undergoes certain transformations (see *Comptes rend.*, 106, 1806). The author calls these organisms "sulfuraires."

No. 2,260.—Eau de Melisse des Carmes (W. J. B., N. Y.).

The original receipt for preparing this celebrated liquor was published by Chevalier some seventy years ago in his *Manuel du Pharmacien*, and attention has recently been drawn to this by Mr. Languelin in an article in the *Bulletin de la Société de Pharmacie de Bordeaux* (reprinted in the *Répertoire de Pharmacie*, Oct., 1888). As it is not likely that it would be a profitable undertaking for any of our readers to make use of that formula, we content ourselves by referring our correspondent to the above-named journals, which he may consult in the library of the New York College of Pharmacy.

No. 2,261.—Listerine ("Acacia").

This is a proprietary article, the composition of which is given as follows by some of our references:

Boric Acid.....	240 grains
Benzole Acid.....	120 "
Borax.....	120 "
Thymol.....	40 "
Oil of Eucalyptus.....	10 drops
Oil of Wintergreen.....	10 "
Oil of Peppermint.....	6 "
Oil of Thyme.....	2 "
Alcohol.....	7 fl. oz.
Water.....	enough to make 32 fl. oz.

There have been other formulæ published, but the difference is not material.

No. 2,262.—Prescription Query (Supplement to No. 2,250).

In our last volume, page 220, we answered a query, in which we were asked how the following prescription is to be dispensed:

℞ Potassii Chloratis.....	3 iiss.
Quinina Sulphatis.....	gr. xl.
Syr. Pruni Virg.....	℥ ss.
Syrupi.....	℥ i.
Aquæ.....	q. s. ad ℥ iv.

Regarding this, we have received the following communication from Mr. M. Van Every, of Buffalo, N. Y.:

"In regard to prescription query No. 2,250, I would recommend the following mode of procedure: Add the syrups and q. s. water to make three and one-half ounces. Heat to about 212° F., and then dissolve the chlorate of potassium. Allow to cool, and add water q. s. to make four ounces, thereby forming a super-saturated solution. Then transfer to a mortar, and thoroughly incorporate the sulphate of quinine. The syrups will hold quinine in suspension."

No. 2,263.—Ascertaining the Level of Liquids in Casks, Tanks (Charleston).

We have a letter from a correspondent who is bothered with a problem which we scarcely expected to be put before us for advice and solution, as it is so simple. Nevertheless, after having received our correspondent's letter, we concluded to make a few experiments with some friends of ours, to see in what manner they would solve it. And as the most simple way only occurred to one of them, and only after having exhausted all other resources, we have concluded to answer our correspondent's query publicly.

The trouble under which our correspondent labored is this, that he has a number of tanks in his cellar, situated on a high platform, and connected with a water-supply, for a purpose which it is not necessary to mention here. The tanks are all closed, having merely an air-vent. None of them have any gauges to show the height of the liquid, the usual custom having been to turn on the water-supply to each tank when it gave a hollow sound on "percussion" to near the bottom, and to turn it off again when water would issue from the air-vent. The tanks are so situated that a gauge or measuring-rod cannot be dropped into them. Now the question was asked, how he may determine the exact level of the contained water at any time, without relying on the uncertainty of percussion. Our advice is as follows: Select a glass-tube of about the

same bore as the faucet at the bottom of the tank, and connect it, by means of a piece of rubber-tubing, with the faucet. Hold or fasten the glass-tube in an upright position, best in contact with the tank, and then open the faucet. The water will, of course, rise in the glass-tube to the same level as it is in the tank. Then make a mark upon the tank.

No. 2,264.—Apparatus for Microphotography (W. S. S.).

If you will consult some of the leading dealers in optical and photographic apparatus, we have no doubt that you will be put on the track of what you are looking for.

We would, however, advise besides that you communicate with the well-known optical institute of Carl Zeiss, in Jena, Germany, as this firm has recently perfected this kind of apparatus very materially. A detailed description of their large-size microphotographic apparatus has recently been published in the *Zeitschrift für Instrumentenkunde* (Sept., 1888), which you may consult in the library of the N. Y. College of Pharmacy. The Scoville Manufacturing Co. and Anthony, of New York, both advertise appliances for microphotography and you may there be able to find what you require without going abroad.

No. 2,265.—Prescription Query (A.).

The following prescription has been sent to us, with a request to state how it should be dispensed:

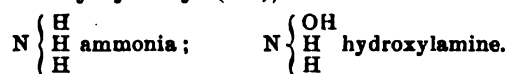
℞ Sapon. Viridis.....	4 Gm.
Ol. Cadini.....	100 "
Glycerit. Amyli.....	100 "

Our correspondent said he rubbed the oil with the soap and added the mixture gradually to the glycerol in a mortar, with constant trituration. But this failed to make a homogeneous mass.

We regret to inform our friend that we have not been any more successful than himself. The fact is, that the oil of cade and the glycerite of starch cannot be made to combine or mix, without the intervention of some other substances, such as alkalies, which it would, however, be improper to add, without the prescriber's knowledge. If the latter can be consulted with, we would suggest that he be advised, either to substitute some other vehicle for the glycerite of starch, or to permit the addition of a small quantity of caustic soda, sufficient to saponify so much of the oil of cade as is capable of saponification. A simple trial will show how much is required.

No. 2,266.—Hydroxylamine (Baltimore).

We have explained the chemical constitution and mode of preparation of hydroxylamine and its hydrochlorate on page 219 of our volume for 1887. Briefly it may be regarded as ammonia (NH₃), in which one atom of hydrogen is replaced by hydroxyl (OH), thus:



The hydrochlorate of hydroxylamine, which is the salt generally employed, has the composition NH₂.OH.HCl. Hydroxylamine is not known in the free state, but only in form of salts.

Last year it was stated (see *AM. DRUGG.*, 1888, 106) that the hydrochlorate of hydroxylamine, which had been found a very efficient reducing agent in photography, would probably be found serviceable in dermatological practice for the same purposes as pyrogallol acid and chrysarobin. Prof. C. Binz has recently published results of experiments made on animals which seem to confirm this. At the same time it was found that the substance, when injected hypodermically, is an energetic poison, affecting particularly the oxyhæmoglobin of the blood and the nerve centres.

No. 2,267.—Preservation of Solutions which deteriorate by Contact with Air ("Analyst").

Our correspondent specially refers to test solutions, such as ferrous sulphate, which rapidly absorbs oxygen from the air, or such as caustic soda, caustic potassa, which take up carbonic acid. He states that he is compelled, for certain purposes, to keep on hand and to constantly use a solution of ferrous sulphate, as free from ferric as possible.

We assume that our correspondent is still a learner rather than an accomplished "analyst." But we will gladly help him out, as far as we are able.

If our correspondent is compelled to keep such a solution as he mentions, on hand for constant use, we would advise him to prepare it either by dissolving pure crystals of sulphate of iron in distilled water previously deprived of air by boiling, or by dissolving fine iron wire in boiling dilute sulphuric acid, leaving any remaining residue in the flask and using the latter itself as reservoir of the solution. A layer of light paraffin oil may then be poured on top to prevent contact with air. The solution may be drawn off by means of a siphon permanently fixed in the neck, and the outlet from the siphon protected by a pinch-cock. The exit of the siphon tube may be kept immersed in a little mercury when not in use. There are various other ways in which the same object may be attained. The chief points are: Free the liquid from air before

adding the sulphate of iron. In the case of metallic iron and dilute sulphuric acid, this is not so necessary, as no ferric salt will form while an evolution of hydrogen gas takes place; yet it is better to heat the acid to boiling and to add the iron gradually.

In place of sulphate of iron, the ammonio-ferrous sulphate (green ammonio-sulphate of iron) may be used. This is much less liable to oxidize than the simple sulphate. If the use of the solution is not interfered with by an acid, a few drops of sulphuric or better still hypophosphorous (10%) acid will contribute towards the stability of the solution. The plan of keeping a layer of pure kerosene or paraffin oil on the surface, is one which we have followed for a number of years. It will not do in the case of all reagents, but in those mentioned by our correspondent it answers excellently. A very fine material for this purpose is the so-called *Albolene Oil* or liquid albolene, which is a colorless, odorless, and tasteless liquid, of the same nature as liquid vaseline or vaseline oil, and for which McKesson & Robbins, of New York, are the agents.

No. 2,268.—Coster's Paste (Detroit).

This is a preparation used in the University College Hospital, London. It has also the title: *Pigmentum Iodi et Olei Pici*, and is prepared as follows:

Iodine... 120 gr.
Light Oil of Wood Tar..... 1 oz.

Mix carefully, applying heat if necessary; after ebullition preserve for use.

Martindale remarks to this: Ebullition generally takes place by the chemical action between the two ingredients. A part of the oil is oxidized, and forms a resinous deposit. Hydriodic acid is probably formed to some extent, as the mixture fails to give any reaction of free iodine. Similar, but more irritating applications are made by combining iodine with creosote or oil of cade in the above-named proportions.—Coster's paste is a useful application for ringworm of the scalp; after well shaking the bottle, it should be well brushed in with a stiff brush. A scab will be produced which should be removed in a few days, the part cleansed by soaking with oil, and then soap and warm water. After drying, more paste should be applied. It seldom causes pain.

No. 2,269.—Diluent for Wax (Dr. L.).

We are asked to mention one or more substances which will mix with wax so as to soften it without rendering it sticky or greasy.

The melting point of yellow beeswax lies between about 143° and 146° F.; that of white wax between about 146° and 150° F. The addition of any substance capable of mixing with wax, and having a lower melting point, will, of course, render it softer. To do this without finally reaching a point when the compound will be greasy, is probably impossible. However, it will depend altogether how far the softening process is to be carried. We would suggest additions of any of the following substances:

1. Paraffin. That having the lowest melting point should be selected. It may be had as low as melting at 100° F.

We should suppose that this would be the most suitable. Paraffin ranges in melting point from about 100° F. to 180° F. It will, of course, be necessary to determine the proper melting point. This may be done roughly by coating the bulb of a thermometer with the paraffin under examination, and immersing the thermometer in water which is gradually being heated under stirring. When the paraffin coat becomes transparent or detached, the temperature is read off. If more accurate results are wanted the coating of the thermometer bulb must be done several days before making the test, as freshly melted or freshly congealed fats do not show the true melting point.

2. Cacao Butter. Perhaps a judicious mixture of this with the preceding might answer. Cacao butter melts at about 93° F.

3. Spermaceti. Melts at about 113° F.

4. Tallow. Melts at about 113° F.

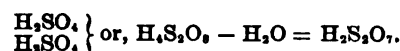
5. Japan Wax, so-called. This is a vegetable fat, melting at about 124° F.

No. 2,270.—Metabisulphite of Potassium ("Photo").

We have had several inquiries from correspondents who asked us to explain the nature of the above-mentioned salt, which had been recommended some time ago as an excellent preservative for the pyrogalllic-acid developer used in photography. It was only after seeing an abstract of a paper by Prof. Eder, of Vienna, that we were enabled to throw a light on this subject. Prof. Eder committed what we cannot help pronouncing a blunder, by giving to a chemical substance previously known by a certain name an entirely new one. In the reports of Prof. Eder's paper which were first published, the newly-given name only was used, viz.: "metabisulphite" of potassium. When the readers of the photographic journals in which this new salt was recommended went to dealers in chemicals and asked for it, they were—as we have ample reason to know—furnished with the "bisulphite" pure and simple. It was supposed that the new-fangled term "metabisulphite" was merely a fancy name, perhaps introduced by

one of the numerous would-be-chemical photographic writers. More recently, however, the confusion has been cleared up. To make the story short, "metabisulphite" is a term applied by Prof. Eder to the salt heretofore known as "pyrosulphite." Though a pyrosulphurous acid is not known in the free state, yet its constitution may be explained or understood easily by recalling the constitution of pyrosulphuric, or fuming, or Nordhausen sulphuric acid.

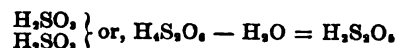
Pyrosulphuric acid (Nordhausen or fuming sulphuric acid) is obtained by the dry distillation of dried and thoroughly oxidized sulphate of iron. Its composition is $\text{H}_2\text{S}_2\text{O}_7$, and it may be considered as having been formed either by the abstraction of 1 molecule of water from 2 combined molecules of mono-hydrated sulphuric acid, thus:



or by the solution of 1 mol. anhydrous sulphuric acid (SO_3) in 1 mol. of monohydrated acid:



In the same manner, *pyrosulphurous acid* may be regarded either as being formed by the abstraction of 1 mol. of water from 2 combined mol. of monohydrated sulphurous acid:



or by the solution of 1 mol. of anhydrous sulphurous acid (SO_2) in 1 mol. of monohydrated sulphurous acid:



This acid, as stated above, does not exist in the free state, but only in form of salts. And it is a curious fact that the two atoms of hydrogen can only be replaced by monad elements and not by a dyad, such as Ca, Ba, etc. It is supposed that the two hydrogen atoms are situated asymmetrically in the stereometric molecule (see Meysztowisz in *Zeitsch. f. physik. Chemie*, I., 73).

Now the "metabisulphite of potassium" is really the "pyrosulphite of potassium," $\text{K}_2\text{S}_2\text{O}_5$. This is prepared by completely supersaturating a strong solution of sulphite of potassium with sulphurous-acid gas, until the latter ceases to be absorbed. The new compound, $\text{K}_2\text{S}_2\text{O}_5$, is comparatively little soluble in cold water, and separates in hard crystals which, when washed, do not exhale the odor of sulphurous acid, possess an acid reaction, and are permanent in the air. It may be preserved in bottles without changing to sulphate, though when kept several years it may undergo a slight partial decomposition into hyposulphite and sulphate (See *Liebigs Ann.*, 224, 222).

No. 2,271.—Sterilized Milk (Several inquirers).

The most practical apparatus for sterilizing milk to be fed to infants was described by Dr. Soxhlet in the *Münchener Medizinische Wochenschrift*, Nos. 15 and 16, 1886. More recently Dr. Aug. Caillé, before a section of the New York Academy of Medicine (*Dietetic Gazette*, April, 1888), described a somewhat simplified apparatus of the same character, manufactured by C. Riessner & Co., 406 Pearl St., which retails at \$4.50, and which has already been rather extensively used in this locality with excellent results.

No. 2,272.—Liniment (J. D. J.).

The correspondent desires a formula for a liniment capable of relieving pain in the hip following amputation some years since, the pain being paroxysmal in character, having intermissions of about three months, and the paroxysms lasting for six to ten days.

Such pain as is referred to is very apt to come from an inflammation of the nerve in the scar, and we doubt whether any local application in the nature of a liniment will relieve it. We would need rather more detailed information than our correspondent gives to be able to form an opinion of the cause of pain, but will suggest the wearing, constantly, of a covering of india-rubber, gutta-percha, oiled silk, or similar impermeable fabric. This is found to often relieve similar pain; and for the acute paroxysms try the internal use of antipyrin and the application of galvanism. The only liniment we will suggest is the ordinary chloroform liniment, to which aconite may be added.

Note on Atropine.—From a paper by Prof. Ladenburg, of Kiel (in *Berichte*, 1888, 3,065), on the recently-published researches concerning the relationship of hyoscyamine and atropine, in which particular reference is made to Will and Bredig's statement (see *AMER. DRUGG.*, 1888, 213) that atropine is an optically active base, we quote only a portion of the concluding remarks:

"I, therefore, arrive at the same conclusion as I did formerly, viz., that atropine is *optically inactive*, and that it bears a relation towards hyoscyamine analogous to that between uvic acid and lævo-tartaric acid."

American Druggist

Vol. XVIII. No. 2.

NEW YORK, FEBRUARY, 1889.

Whole No. 176.

[ORIGINAL COMMUNICATION.]

COMMENTARY UPON SOME FORMULAS OF THE NATIONAL FORMULARY.

BY AD. TSCHEPPE, PH.D.

THE *Druggists' Circular* for January contains a reprint of a contribution from the pen of Mr. Geo. M. Beringer to the Polyclinic. Amongst the features objected to in various formulæ contained in the National Formulary, there are some for which I have to confess parentship, and, like a father fond of his child, and naturally inclined to resent undeserved censure bestowed upon it, I beg leave to offer a few remarks in explanation of the motives which prompted the presenting of these formulas to the Committee of the National Formulary. I do not desire to rebuke Mr. Beringer for his criticisms, for I know that without a commentary on these and many other formulas of the book, the chance of misinterpretation is open to all not acquainted with the inside history connected therewith. As the book itself did not permit the introduction of any lengthy discussions of the merits of the several preparations, or the chemistry of its formulæ, beyond short annotations, the authors owe to the public an exhibition of the reasons which determined their actions, and in the interest of the book I shall try to correct the neglect by inaugurating a short commentary on formulas which stand in need of some explanation, or which may be benefited in some way by such prophylactic treatment. I shall select such titles for discussion as are most congenial to my personal experience and practical knowledge, leaving the rest to others interested in them. I may also be allowed to extend these remarks to formulas not contained in the book, having either been overlooked or not being ripe enough for publication when the book was completed, but which will demand consideration when a supplement to or a revision of the book will become necessary.

1. LIQUOR ACIDI PHOSPHORICI COMPOSITUS.

The critic finds fault with the material prescribed in the formula, and stigmatizes the process as a pharmaceutical crudity worthy of the lizard age of pharmacy. The building up of the formula from definite separate ingredients would have been preferred, especially a formula of Dr. Pepper, presumably that published by Mr. Jas. T. Shinn, in the *Amer. Journ. Pharm.*, 1880, 481, in which certain amounts of the phosphates of calcium, magnesium, and potassium (also iron in a second formula) are dissolved in water with the aid of phosphoric acid. In reply to this criticism, I have to say that the object of the formula was to obtain a product similar to a proprietary article which, for a number of years, has been in universal use throughout the United States.

The formula is not a haphazard one, taken from a hog-skin-folio of a time when the rule of thumb prevailed, but was framed and minutely gaged through knowledge gained by modern analytical work on the prototype for the intended preparation, and on the process for its production. By cautious work the similarity is so close, that the absolute and the relative proportions of the components of the two preparations are like photographic prints of one plate, and I do not doubt but that the original acid phosphate is obtained in precisely the same manner.

The analytic process which is laid down by the text-book patterns being rather tedious, I endeavored to find a new method which would be more practical and expeditious. From the intimacy gained during this research, I was lucky enough to find such a one, which will be serviceable for assaying the entire list of syrups, elixirs, and other preparations containing iron phosphate in combination with alkaline or earthy bases. The method was published by me several years ago (*Deutsch-Amer. Apoth. Zeit.*, viii., 1887, No. 1, 2, 5).

In answer to the charge of a lack of definiteness of composition, if such complex material as bone-ash be employed, I may state that bones, as a product of nature, do not vary to such an extent as the separate ingredients do, as found in the shops, and from which the preparation might be composed. But it was at no time my intention to employ the separate salts. I would have deemed it a waste of time to rebuild artificially a structure from material obtained from its own destruction. Acid phosphate forms the starting point in the manufacture of phosphoric acid, pure and especially free from the very bases with which it has to be recombined in order to obtain the product again, artificially, from its components. Such a process would deserve the emblem used in olden times by pharmacists, of the recoiling snake biting its own tail.

I will not close this subject without pointing out one advantage of this formula to those who did not see for themselves, namely, the low cost of its production. If the bone-ash is bought in the market, a gallon of the preparation comes to about twenty-five cents, and if the operator

prefers to trust rather to a self-prepared article, it will be a very simple matter for him to calcine the bones, which are otherwise only a refuse in the household. In this case a gallon of the finished preparation will require only an outlay for two pounds of sulphuric acid.

2. ELIXIR FERRI, QUININÆ ET STRYCHNINÆ.

The critic considers this formula as supernumerary and cavils at the use of the tincture of citrochloride of iron in supplying the iron.

The answer is that a preparation under above title is frequently called for, the word "Phosphate" or "Phosphates" being omitted, and the choice of the combination being apparently left to the dispenser. The elixir made with citrochloride of iron has several advantages over that made with phosphate or pyrophosphate of iron. These advantages need simply to be known to be appreciated. The finished elixir keeps its bright green color for an indefinite time, and never spoils on standing. The liquor or the tincture of citrochloride of iron admits of a wide range in its reaction without losing its equilibrium, and they are admissible where either a decidedly alkaline or an acid reaction is desirable to prevail in the preparation. In fact, they are admirably adapted for a number of preparations where the combination of the iron is not otherwise specified. The color varies from a yellowish brown, if alkali is in excess, to a bright or dark green, when neutral or acid reaction is prevalent. The development of the intensely green color serves as its own indicator when the proper stage of neutralization is reached.

Several years ago, when pyrophosphate of iron was in vogue, which is now supplanted by the phosphate, there was not a single formula in existence which furnished a completely satisfactory elixir. There were two alternatives: either the elixir became of a dark inky tint on standing for only a short time, when a slight excess of ammonia had been added, or it deposited the iron pyrophosphate in a jelly-like form when there was no excess of alkali. During this time, I noticed that the preparation as furnished by a prominent firm in this class of goods changed its behavior, and kept its color without changing. Upon examination I found that the elixir did not contain a particle of phosphoric acid, although this figured on the label, and the preparation bore evidence that the above-mentioned citrochloride of iron had been used as a substitute for the annoying pyrophosphate. From that time to this, I have used the citrochloride to my entire satisfaction, and can still recommend it to all who have never tried it. It is only recently that the formula of phosphate of iron, quinine, and strychnine has been so improved by recommendations of my own that it will be found generally satisfactory, which fact renders this formula less necessary than before.

3. PEPSIN.

The tenor of the criticism makes it obvious that the pepsin puzzle is not yet as fully and as generally understood as it ought to be by this time, and an elucidation of this question seems to me to be one of the most important themes to dilate upon.

The critic finds fault that no precise description of the kind of pepsin to be used for the preparations has been given in the National Formulary and that the process for making it has been omitted. Regrets are expressed, that the process of Scheffer, which is stated to be "admittedly the best," has not been made official in the U. S. P.

To this I have the following answer to make:

Pepsin can only be criticised by testing it for its solvent or digestive power. It is impossible to judge its quality by physical description. As there are several different pepsins now in the market which show a nearly equally high solvent power, while the nature of their vehicles is of very different character, the Committee on National Formulary did not lay any stress upon the accessories, but standardized its solvent power, for the determination of which an elaborate and excellent method has been given.

Pepsin is the peculiar ferment, found in the secretion of the stomach, which has the property of converting albumen into peptone in an acidulated medium. Like all animal secretions generally, this secretion is of a complex nature, from which the isolation of the ferment as a distinct body has not yet been successfully accomplished. Several of the better-defined accompanying substances can be removed without impeding its action, and enough has been learned to show that the ferment proper is not an albuminoid. The name "pepsin" is usually applied to preparations derived from the stomach, which either represents its secretion in its entirety, or part of it, with or without additions not derived from the secretion. The principle which effects digestion being intangible, it follows that there is no such thing as "pure" or even as "undiluted" pepsin as a commercial article, and that the accompanying substances are not essential to the pepsin proper, but simply perform the office of a vehicle for it.

It also follows that any process which hinges upon reactions peculiar to the accompanying or secondary bodies, has no bearing upon the active principle itself, and may be discarded as useless. The process should only extract the principle contained in the stomach and should not introduce into the product more than the smallest possible amount of these accessory substances, otherwise there will be dilution, *vulgo* adulteration, of the pepsin.

Scheffer's method is based upon the property characteristic of albumens, of being precipitated from their acidulated solutions by addition of various salts, as a cream, which rises to the surface. If this process is applied to the secretion of the stomach, this precipitate (consisting of albumen present in the extract from the stomach) will show the properties of pepsin, and has been mistaken for pepsin itself. It is true that the precipitate retains a larger proportion of pepsin than could be due to mere mechanical admixture from imbibitions of the menstruum, and that the albumen exerts a similar affinity to the pepsin as certain fibres do to certain dyestuffs; but the fact remains that the pepsin can be gradually washed out from the precipitate through washings with acidulated, saturated solutions of salt, and that upon repeated precipitations of the albumen the digestive property is lost completely. Thus this highly praised and almost idealized process must be admitted to have been a pleasant dream, and entails in practice such a loss of the digestive power contained in the stomach that its product cannot successfully compete with that obtained by other and more simple methods.

In contrast to this stands Jensen's patented process, by which no such loss of the digestive power is sustained, and by which the product is likely to contain all the pepsin contained in the stomachs employed. It consists in digesting the stomachs in an acidulated menstruum at a proper temperature, and finishing the preparation without further chemical manipulation by simply evaporating the liquid portion to dryness. Its high digestive power actually brought about a revolution in the aspirations of manufacturers toward a higher mark of the activity of their outputs, which, since then, has been successfully accomplished. The inventor himself seems hardly to have been aware of the true working of his process, and originally had laid his principal claims for recognition of his product on the absurd pretension that his pepsin was crystallized, while its structure is as much amorphous as that of gum-arabic or glue.

The appellation "peptone-pepsin," by which pepsins so prepared are characterized, is a phrase much met with, and, as may be inferred from its misuse, often enough demonstrates the fact that the user did not understand its meaning. By subjecting the stomachs to digestion by its own pepsin, not only are the albuminoids contained in the secretion of the stomach, and which forms the vehicle of the pepsin as obtained by Scheffer's method transformed into albumin-peptone, but the tissue of the stomach is likewise dissolved. The tissue of the stomach consists largely of collagen, which is transformed by peptic digestion into gelatin-peptone, *vulgo* "liquid glue." The chemical and physical behavior of these two peptones is so analogous that most, and even the principal reactions for peptone, answer for both; and this identity is so nearly perfect, that the fact of the larger part of Jensen pepsin being glue has never been discovered, although the inference from the process itself leaves no alternative. These peptones are, like the albumen in Scheffer's process, simply accessories acting as a vehicle of the digestive principle, and have no connection with the action of the pepsin proper. I intend to show that Jensen's process is by no means necessary for obtaining the highest grade of pepsin. On the contrary, the digestion may be carried so far that undue dilution of the product is the result; for if the entire stomach were dissolved, it must be obvious that the product could not be richer in solvent power than an equal proportion of dried stomach itself. But if moderately applied, so as to open the pepsin cells only, the extraction of pepsin is much facilitated and the tenacious mucus, impeding filtration of the undigested juice, is liquefied by peptonization and thus most easily disposed of.

High-grade pepsins are offered in the market which cannot be classified in either group just mentioned. One especially seems to be nothing more nor less than the dried coating of mucus scraped off the stomachs. Although consisting of one-third of insoluble matter, it stands at the head of all pepsins in its solvent power. Experiments sustain the theory that this most simple process furnishes the best pepsin. Clarification is difficult, but the filter-press and paper-pulp may overcome the difficulty.

The demand for scale preparations of pepsin and the enormous profits derived from a large sale have brought on a lively competition of a number of manufacturers, in which evasion of patent-right claims and of some objectionable features of pepsin on one hand, and good appearance of the preparation on the other hand, are most conspicuous, more even than the strife for excellency of the product as to solvent power. Some time ago I came across a novelty in the way of finishing the preparation which is interesting enough to be related. I found a scale pepsin of German importation, of good solvent power, and in beautiful scales, to consist largely of *gum arabic*. This had been added partly to produce the scales and partly to

overcome the hygroscopic quality of the product, thus allowing the scaling in thinnest lamellæ. Thus this pepsin presented the appearance of Jensen's pepsin, without being an infringement upon it, owing to the absence of peptone; neither could I discover any albumen or sugar. Albumen and peptone yield a copious precipitate with tannic acid or alcohol; but, when acidulated, the solution is not precipitated by alcohol. In the case of this pepsin, the reaction with tannin failed to respond to albumen, but the precipitate with alcohol appeared after acidulation. The solution did not reduce Fehling's solution originally, but after boiling with hydrochloric acid it did. The precipitate was identified as acacia. I do not regard this addition any more as an adulteration as the overloading with albumen or peptone, which may as easily assume the proportions of a fraudulent adulteration.

New York, January 23d, 1889.

THE ART OF DISPENSING.

[Continued from page 3.]

WEIGHTS AND MEASURES.

THE systems of weights in use at the dispensing counter are of two kinds: The apothecaries, generally, though improperly, called the Troy, and the metric. The table of apothecaries' weight as used in our pharmacies is as follows:

20 grains = 1 scruple.
3 scruples = 1 drachm.
8 drachms = 1 ounce.

Beyond the ounce the system is not here considered, for although there is another line in the table, viz.:

12 ounces = 1 pound,

neither pharmacopœias, prescriptions, nor medical formulas recognize it. When more than one ounce is wanted, its multiples are expressed as two ounces, three ounces, sixteen ounces, &c.

The name Troy, probably, was adopted in the earlier pharmacopœias, and by the pharmaceutical and medical professions, because the Troy system was used in philosophical experiments before the adoption of the metric system, and because both the Troy and apothecaries' systems contain grains, ounces, and pounds that are identically the same in weight, as, for instance, the table of Troy weights is follows:

24 grains = 1 pennyweight.
20 pennyweights = 1 ounce.
12 ounces = 1 pound.

Here there are the same number of grains in the Troy ounce as in the apothecaries' ounce, viz.: 480, and the Troy pound consists of twelve ounces, the same as the apothecaries' pound.

The name Troy weight in place of apothecaries' weight having become sanctioned by long established custom, it would be folly to attempt to change the term now, as it would only create confusion, and there is enough of that already in regard to weights in both the pharmaceutical and medical professions to forbid us from creating any more. The dispenser will, therefore, bear in mind that, though formulas will frequently be met with where scruples and drachms are referred to as Troy weight, they are meant to represent the one-twenty-fourth part for the scruple, and the one-eighth part for the drachm of the Troy ounce.

Again this Troy or apothecaries' system of weights must not be confounded with the avoirdupois system which is in general use in commerce. Almost every drug is purchased by this system. This is not always remembered by pharmacists, but it is important, because the ounce of this system contains only 437½ grains, just 42½ grains less than the Troy ounce, and when one-eighth of an ounce of any drug is purchased, the pharmacist will obtain not 60 grains, as he often supposes, but 54.68 grains. This will account for the apparent shortness of weight in cans and bottles of quinine and morphine heard of in complaints of many pharmacists. It is important, also, that the difference in weight between the ounces of the two systems should be remembered. When preparations are to be made by Troy weights, the requisite number of grains, viz., 42½, should be added to each ounce if the pharmacist uses avoirdupois weights; otherwise the preparation will not be of proper strength. When preparations of the pharmacopœia are made according to the present formulas, this difference is not so important to be remembered, for, as all its formulas are expressed in parts by weight, it is immaterial whether the avoirdupois or Troy is used, since all the ingredients as well as the finished product are weighed by the same system.

The avoirdupois system in its subdivisions has been modified in use, for while it calls for sixteen drachms to the ounce, in almost every store it is the custom to refer to the ½ ounce weight as one drachm, and to the ¼ ounce as four drachms. The practice of considering that there are but eight drachms to the ounce is of course erroneous, but it is the common usage.

It is lamentable that this country has not outgrown

these different systems which were established about four hundred years ago, when the basis of weights, measures, and length was a purely arbitrary one and subject to change at any time. We read that in 1266 it was decreed that the pennyweight should consist of the weight of 32 grains of wheat from the middle of the ear, well dried, and that twenty of such pennyweights should make the ounce. It did not matter to the old law-makers whether the grains of wheat from any one stalk or of any one year's growth were larger or heavier than others, thirty-two of them, whether light or heavy, must be the standard. The number of grains to make a pennyweight was afterwards reduced to twenty-four. Twelve of the Troy ounces, which made the pound, at the old weight of the pennyweight (32 grains), weighed 7,680 grains, the same as sixteen of the Troy ounces, at the present weight of the pennyweight (24 grains).

The term "ounce," though now limited to measures of capacity and of weight, was originally applied to length as well, and meant in all cases the twelfth part, thus the inch, the twelfth part of a foot, was called an ounce, and this is the reason why, in Troy and apothecaries' weight, there are twelve ounces to the pound. The term "scruple" is of very old derivation, and was the lowest unit of weight among the Romans. It was not always limited to weight, but was also used as a measure of time and of length. Among the Chaldees, Jews, and Arabs it signified the $\frac{1}{60}$ part of an hour, but later it was known as the $\frac{1}{60}$ part of an hour, which we now call the minute, and was then subdivided into "second scruples," which gives us the derivation of our seconds, the $\frac{1}{60}$ part of a minute. The term "drachm" was used by the ancients to represent a silver coin, the basis of their monetary system. It was the $\frac{1}{6}$ or $\frac{1}{16}$ of a mina, which in turn was

Thus there are 20 ounces in the pint, instead of, as in the United States wine measure, 16 ounces. The fluidounce of the imperial measure weighs 437.5 grains, the same as the avoirdupois ounce. The imperial gallon weighs 10 pounds avoirdupois at a temperature of 60° F.

English graduated measures should not be used at the dispensing counter or in the manufacturing department in this country unless they have been carefully tested, for they are generally graduated for the imperial fluidounce, and in consequence will not measure as much as the U. S. fluidounce.

The sign for minims is written thus, π ; the sign for the fluidrachm, fldr. or fl 3; that of the fluidounce, floz. or fl. 3; for the pint the letter O is used, it being the first letter of the Latin name *Octarius*, meaning an eighth part. The abbreviation pt. is often used for pint, but should be discouraged, as it may be mistaken by some for *part*. "Cong.," or C. stands for gallon, it being an abbreviation of the Latin name *Congius*, meaning the gallon. Gal. or gall. is often used as an abbreviation of gallon.

Linear Measure.—Inches, feet, and yards are often met with in prescriptions. There are 12 inches in 1 foot and 3 feet in 1 yard.

The Metric System.—Probably this system has, of late, been talked of more than any other system of weight and measure, and yet is less known or understood by most dispensers and prescribers. It is often a stumbling block in pharmacies and in physicians' offices, and causes more confusion than anything else about prescriptions. Probably the reason for this is that, except in certain localities, it is not used often enough for the parties interested to become thoroughly familiar with it, for, unless one has the chance to practise the system every day, it will soon be forgotten. Of course, this is mainly the fault

LENGTH.	WEIGHT.	CAPACITY.
10 millimeters = 1 centimeter.	10 milligrammes = 1 centigramme.	10 milliliters = 1 centiliter.
10 centimeters = 1 decimeter.	10 centigrammes = 1 decigramme.	10 centiliters = 1 deciliter.
10 decimeters = 1 meter.	10 decigrammes = 1 gramme.	10 deciliters = 1 liter.
10 meters = 1 dekameter.	10 grammes = 1 dekagramme.	10 liters = 1 dekaliter.
10 dekameters = 1 hectometer.	10 dekagramme. = 1 hectogramme.	10 dekaliters = 1 hectoliter.
10 hectometers = 1 kilometer.	10 hectogrammes = 1 kilogramme.	10 hectoliters = 1 kiloliter.
10 kilometers = 1 myriameter.	10 kilogrammes = 1 myriagramme.	10 kiloliters = 1 myrialiter.

the $\frac{1}{6}$ of a talent, the latter piece of money having a varying value in different countries. These coins were also used as weights, the weight of the drachm varying from 60 to 68 grains. The signs used to represent these different weights are

For grains, gr.; scruples, \mathfrak{D} ; drachm, \mathfrak{z} ; ounce, $\mathfrak{℥}$.

Liquid Measure.—The measures of capacity used in pharmacy are also of two kinds, that called wine or liquid measure, and the metric system. The table of wine or liquid measure resembles somewhat the apothecaries' weight. It is as follows:*

60 minims	= 1 fluidrachm.
8 drachms	= 1 fluidounce.
16 ounces	= 1 pint.
8 pints	= 1 gallon.

This is the legal gallon of the United States, and contains 231 cubic inches. It is known as the Winchester wine gallon from its standard having been formerly kept at Winchester, England.

A common error, made by many pharmacists, is that the fluidounce weighs 480 grains because it contains that number of minims. Its weight is 455.7 grains, and the weight of the pint is 7,291.2 grains. This shows the complexity of our system of weights and measures more than anything else, and the old couplet that is so generally quoted and believed in,

A pint's a pound,
All the world round,

is not at all true, and will mislead any one who tries to put it into practice, for it can be easily seen that a pint of water at the temperature of 60° F. will weigh 291.2 grains more than an avoirdupois pound, the fluidounce 18.2 grains more than the avoirdupois ounce. While this difference seems of small account on the ounce, it amounts to nearly two-thirds of an ounce on the pint, and on the gallon, or eight pints, it is proportionally more. Water, or any liquid, when ordered to be weighed should never be measured.

The liquid measure used in England is of a still different proportion. It is known as the *Imperial measure*, and is as follows:

60 minims	= 1 fluidrachm.
8 fluidrachms	= 1 fluidounce.
20 fluidounces	= 1 pint.
8 pints	= 1 gallon.

* Note by Ed. Amer. Drugg.—Though this chapter contains some very elementary matters, for instance, this table of liquid measures, no doubt familiar to most of our professional readers, yet, for the sake of completeness, and for the benefit of the learners and beginners, we have found it advisable to insert them.

of the prescriber, for, if physicians should write prescriptions in the metric system, pharmacists would soon be forced to understand it. As it is, there are but few stores that can show an average of one metric prescription a week, even in large cities; in most country places, they are not seen at all.

Though there is such a prejudice on the part of both the medical and pharmaceutical professions against the metric system, it is a necessary part of the pharmacist's education, and therefore his duty to understand it, for it is used in certain preparations of the Pharmacopœia of the United States. Most foreign prescriptions, and many text-books on chemistry and pharmacy are written in that system, besides it is used by all chemical and philosophical experimenters. It is a very easy system to remember, especially so to people of this country, because it is based, like our Federal currency, on a decimal system, viz., a system of dividing or multiplying by tens. Almost any child can repeat the table of Federal currency:

10 mills	make 1 cent.
10 cents	make 1 dime.
10 dimes	make 1 dollar.

This was framed on the principle of the metric system, when our country was young, and corresponds to it in a great degree, as will be seen when we compare it with the above metric table.

The basis of the metric system is the *meter*, which is a measure of definite value, and though all traces of weights and measures should be lost, the meter could at any time be replaced. It is known as the $\frac{1}{10,000,000}$ part of the distance from the equator of the earth to its pole or the $\frac{1}{40,000,000}$ part of the whole circumference of the earth starting at one of the poles.

The meter, then, is the *unit of length*, and to obtain greater and lesser lengths it is multiplied or divided by ten. From the meter the *unit of capacity* and the *unit of weight* are derived. The unit of capacity is called the *liter*, and is obtained by taking the cube of the tenth part of a meter, or the cube of a decimeter. The unit of weight is called the *gramme*, and is obtained by taking the weight of the cube of the one hundredth part of the meter or the cube of a centimeter. As in the length, the greater or lesser quantities of capacity and weight are obtained by multiplying and dividing by tenths.

The tables of the metric system are given above.

The prefixes used to designate the multiples and the decimals of the units may bother the beginner a little, but a short study soon overcomes that difficulty, and, as can be seen by referring to the tables, they are the same for the three measures, *milli*, *centi*, and *deci* for the decimals,

and *deka*, *hecto*, *kilo*, and *myria* for the multiples. The former are Latin terms, the latter are Greek.

In prescription work, metric terms are seldom met with, excepting the milligramme, the centigramme, decigramme, and the gramme for weight, and for measure the cubic centimeter and the liter.

The abbreviations of the terms are:

Meter,	M	Gramme, G or Gm
Decimeter,	Dm	Decigramme, Dgm or Dg
Centimeter,	Cm	Centigramme, Cgm or Cg
Millimeter,	Mm	Milligramme, Mgm or Mg
	Cubic Centimeter, C.c.	

The period . is used to divide the gramme, meter, and liter from their fractional decimals, as for instance, one gramme and five decigrammes would be written thus 1.5, one gramme and fifteen centigrammes would be written 1.15, one gramme and two hundred and fifty-five milligrammes would be written 1.255. The similarity between this method and that of writing our Federal money can be appreciated at a glance.

Sometimes in place of the period, a line is used, thus:

1	5
1	15
1	255

All on the left of the line being the gramme, if this is to represent weight, and all on the right the decimal fractions of the gramme.

Physicians' prescription blanks are sometimes printed with lines dividing each of the decimals, and then generally have the abbreviations of the terms at the top of the spaces, as for instance:

	Gm.	Dgm.	Cgm.	Mgm.
R				

This method of printing is a commendable one, as it lessens the liability to make mistakes by those who are not very familiar with this system.

Prescriptions will sometimes be received with the name of the weight written on the same line as the figures; be careful in such a case to find out just what is meant, for a prescription written 1.5 milligrammes might mislead many to think that it meant one gramme and five decigrammes equivalent to about twenty-three grains; it may be mistaken for one gramme and five milligrammes, whereas it probably means only one and five tenths milligrammes, which is about one forty-third of a grain. An error like this did happen a few years ago, and resulted in the death of the patient using the prescription.

In the back of the pharmacopoeia there is a table devoted to the equivalents of the metric, Troy and avoirdupois systems, which will be of great aid to any one wishing to translate one into the other. It is best, however, to try to think in the metric system and to use the metric weights and measures. If doses of medicines were memorized in the metric system, instead of, or even in connection with, the Troy system, there is no doubt that the metric system would soon be the only one used. The reason why it seems so difficult is that the attempt is made by nearly all to think in the old system, and to make the new one conform to that.

PRESCRIPTION SCALES.—All prescription departments should be furnished with at least two pairs of prescription scales, one to be kept for weighing small quantities (never over twenty grains), and the other for the larger quantities up to the half-ounce. By keeping a scale for small quantities, it will be found that its delicacy will be retained for a very much longer time than if used for all weights, heavy and light. In too many pharmacies can there be seen prescription scales which will not turn for the one-quarter of a grain and often will hardly weigh one grain; this is due partly to the beam having been overstrained, the bearing points dulled by too large a weight having been used on some occasion, or by rust or dirt being allowed to collect on them.

The prescription scale should never be cleaned with anything besides water, and if care be exercised nothing else is needed. They should always be inclosed in a case, so as to be protected from the air and dust, and every day or many times through the day, wiped off carefully. If any of the article being weighed should drop off the scale pan, wipe it up as soon as possible, for it may discolor anything it remains upon. Some ordinary substance such as bromide of potassium will corrode or turn green the metallic portion of the scale if it is allowed to remain there. Glass scale pans are the best, since they can be so readily cleaned. Remove the metal pans, wrap them up in tissue paper, and lay aside in a safe place where they can be found readily and used in case of an urgent necessity, as when a glass pan is broken. Always see that your scale balances before attempting to weigh.

It is well to place pieces of paper of even weight on

the pans, for by this means you avoid the danger of spilling anything you are weighing, or of soiling the pans, and as the paper is easily gathered up, less waste occurs, as the substance weighed can be at once carried to where you wish to deposit it. Keep the case door closed when the scale is not in use, put away the weights after using them, and in all cases, when handling weights, use a little pair of nippers so as to avoid rusting them by the moisture of the fingers. One thing often neglected is keeping the drawer, containing the weights, closed, especially when conveying anything on a spatula from a bottle to the scale pan; it is a very common, disagreeable sight to find this drawer full of all sorts of drugs that have dropped, and which tend to destroy the weights lying in the dirt.

Graduates.—Have plenty of graduates and minim glasses ready for use, and before they are used in the prescription department, test them to see if they are accurate; if they are not, discard them at once, for they will some time cause trouble. The best shape for a graduate is cylindrical or as near cylindrical as possible. A conical one is not so likely to be accurate. Select one in which the lip drops down a little, for the liquid will pour into a bottle much better and without choking up its neck and slopping over on the counter or floor.

CAREFULNESS IN MEASURING AND WEIGHING.—When measuring one or two drachms or less of a liquid, always use a minim glass. The smaller quantities and thinner fluids should be measured first, or if, for good reasons, this rule cannot be put in practice, see that your measuring glass is clean for these small quantities. These rules must especially be remembered when measuring portions of an active drug.

The practice of dividing powders, in most pharmacies, after weighing and mixing is to gauge them by the eye. It is much better, when the prescription contains a potent preparation, such as arsenic, strychnia, etc., to weigh each powder, and thus be sure you are exact, or if it be not practicable to do this, at least one powder should be weighed in order to start with a correct standard for size.

Never dispense drops when minims are ordered, because drops vary in size according to the nature of the liquid, the lip of the bottle, the quantity in the bottle, temperature, etc. Thus chloroform dropped from an ordinary bottle will give 150 to 300 drops to the fluidrachm, dilute hydrocyanic acid about 45 drops, Magendie solution of morphine about 30 or 40 drops. Croton oil will measure almost any number of drops to the fluidrachm, according to the shape of the lip of the bottle it is dropped from, though it generally goes 104 to the fluidrachm.

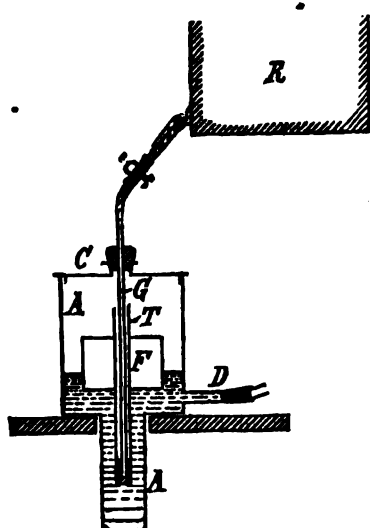
It is convenient to have the weight of a certain number of minims marked on the bottle containing some of the fluids commonly prescribed in small quantities, for in some cases it may be desirable to weigh rather than measure a liquid; for example, in the case of 12 to 15 minims of croton oil ordered for pills, it is practically impossible to get this amount of croton oil out of a measure, but it may be weighed on the glass scale pan, either upon some inert powder, as soap or licorice powder, previously weighed, or some of the powder of the pill mass may be mixed with it on the scale pan, and the whole afterward carefully scraped off.

Minim pipettes are a very necessary part of the dispenser's outfit; they are of different capacities, being graduated to hold 15, 20, 30, 60, and 120 minims. The simplest form consists of a glass tube of small calibre with its lower end contracted, and is used by dipping the contracted end in the liquid, and applying suction by the mouth at the opposite end. By this means the liquid is drawn into the pipette, the tip of the forefinger is now tightly applied to the upper end of the tube, and the flow of the liquid regulated by raising slightly the finger, enough being allowed to run back into the receptacle from which it was taken, until the height in the tube has reached the mark desired. The finger being pressed down, the flow is at once stopped, and the liquid can be transferred to the bottle, mortar, or graduate, when, by raising the finger, it will flow out.

An improvement on this form, obviating the use of the mouth, is to have an unperforated rubber nipple drawn tightly over the top of the tube; compress the nipple, thus forcing out the air, and insert the lower end of the pipette in the liquid; relieve the pressure on the bulb, the pipette will fill to the mark required, or if not, then push the bulb upward gently until the amount is obtained. A third modification is to have two tubes, one large and the other smaller but longer; the smaller one fitting in the larger, the both connected with a band of rubber stout enough to allow the smaller one to move up and down easily, and yet tight enough to prevent ingress of air. (The outer tube may be of rubber.) The small tube is graduated, and is contracted at the bottom. By simply closing the top of the large tube with the finger, and drawing it up with the thumb and other finger, the small tube meanwhile held firmly in the liquid with the other hand, the liquid will enter to the mark desired; by simply removing the finger (or the cork stopper which may be used), the liquid will run out.

When using glass measures, especially cylindrical ones of small diameter, it will be noticed that the surface of the liquid becomes concave, the edge of the liquid creeps up the side of the glass, due to its capillary attraction, this is called the *meniscus*, or little moon, and opinions vary among chemists which point of the liquid should be selected to read from. It matters but little whether the extreme top or the lowest portion is selected, provided all measurements are uniformly made from the same point. A line drawn between the upper and lower points just about the middle of the curve would give the most correct reading. While it is not a matter of very great concern in most of pharmaceutical operations which point is used, it is well to accustom one's self to exactness in everything connected with prescription work.

(To be continued.)



Claes' regulator for water bath.

A NEW BURETTE.

A BURETTE without stop-cock has been devised by C Gerhardt. As will be seen by the accompanying cut, the burette consists of two separate portions, viz., the graduated tube with obliquely directed outlet, and a conical end-piece, accurately ground to form a perfect joint, and also having an oblique bore. Projecting arms on the neck of the burette and on the cone are intended to be held together by rubber rings. To cause liquid to flow from the burette, the cone is made to slide laterally until the bore is continuous.—*Zeitsch. f. angew. Chem.*, 1888, 676.

CONSTANT LEVEL REGULATOR FOR WATER-BATHS.

FOR the purpose of preserving a constant level in water-baths or other vessels, P. Claes recommends the arrangement here shown, which is based on the principle of Bunsen's float. The cylinder-shaped vessel A, made of sheet-zinc or sheet-iron, contains a float F, through the centre of which passes a copper tube T, about $\frac{1}{4}$ inch wide, which is closed at its lower end, and contains a certain amount of mercury to form a joint. The glass tube G, conducting water from the tank or reservoir R, is firmly fixed in the top of the cover at C. Whenever water flows off through D, the float F with tube T sinks, and thereby eventually brings the outlet of the glass tube G above the surface of the mercury, when water will flow into the apparatus until the orifice of the tube is again underneath the mercury. The amount of the latter depends upon the height of the column of water. 8 C.c. ($3\frac{1}{4}$ inch.) will balance about 39 inch. of water.—*Zeitschr. f. angew. Chem.*, 1888, 392.

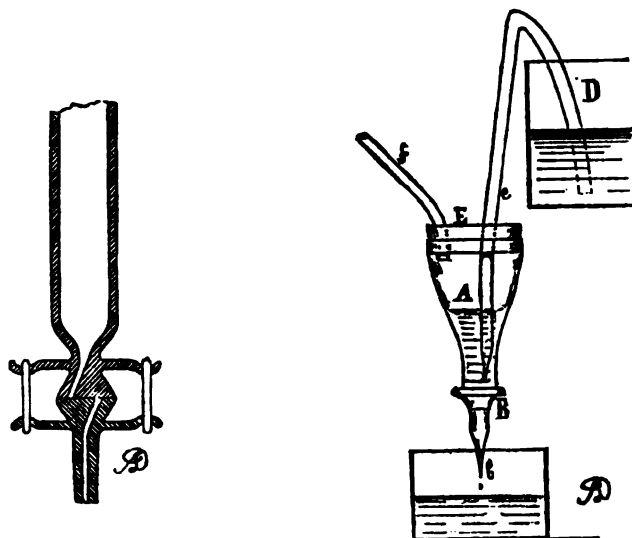
Citric Acid in Cows' Milk.

EXPERIMENTS made by G. T. Häckel have confirmed the presence of citric acid as a normal constituent of cows' milk. The examination of a great number of samples show that they contain from 1.8 to 2.2 Gms. of calcium citrate, and from 0.9 to 1.1 Gms. of citric acid per liter, or about 0.1 per cent of citric acid; so that the quantity of citric acid yielded by a good milking cow in a day amounts to as much as that contained in two or three lemons. The lime found in milk serum generally exceeds that combined with the mineral acids; the presence of citric acid will now explain this apparent anomaly. This acid is supposed to be derived either from citric acid in the hay or green fodder, or to be formed from the decomposition of cellulose. The concretions frequently found in condensed milk consist of pure calcium citrate, and as human milk contains no citric acid, it is perhaps characteristic of milk from herbivora.—E. SOXHLET in *Bied. Centr.*, abstract in *J. Soc. Chem. Ind.*

A NEW DROP-DELIVERER.

A. GERNGROSS, of Frankfurt on the Main, describes a new apparatus which may be regulated to deliver drops at any previously determined and uniform rate.

The reservoir D contains the liquid which is to be delivered in drops. The drop-funnel proper, A, ends in a nipple B, of which there is a series varying in the diameter of the outlet, and which are interchangeable. The mouth of the drop-funnel is closed, air-tight, by means of the stopper E. Through the latter pass two tubes, a small one, ending just below the stopper, the object of which is to start the siphon e, the longer leg of which, ending in a point (likewise exchangeable for others of larger or smaller calibre), passes through the other perforation in the stopper E.



Gerhardt's burette.

Gerngross' drop deliverer.

To start the apparatus, the drop-funnel A is filled to about one-half with the liquid from the reservoir D. The stopper E is then tightly inserted, and the funnel so adjusted that the shorter leg of the siphon dips into the reservoir. By suction at f, the siphon is now filled, and f immediately closed. In proportion as the liquid escapes in drops below, more of it enters the funnel through the siphon.—*Dingler's Pol. Journ.*, 270, 186.

Removal of Tattoo-Marks.

NEARLY every year we have one or more letters of inquiry as to the means for removing tattoo-marks, and we have been obliged to reply that, practically, it is not possible. Dr. G. Variot, of the Paris Biological Society, has, however, lately proposed a process which he declares to be invariably successful in removing blue and red tattoo-marks. As the doctor is attached to the central infirmary of the Paris prisons, he has undoubtedly abundant opportunities for experimenting, and should be able to speak intelligently. Dr. Variot operates as follows: The tattooed parts are first wetted with a concentrated solution of tannin, and then, with a set of tattooing-needles, the skin is punctured all over the colored portions to the depth usually adopted by professional tattooers. All the parts tattooed with tannin are then rubbed over with a crayon of nitrate of silver until the needle-pricks have turned black. Excess of liquid now being wiped off, matters are allowed to take their own course. The whole surface treated will soon turn black. The pain, which is quite moderate during the operation, continues to be slight for the first two days, and is attended with some local inflammation. After the third or fourth day no pain is felt, and, excepting for large marks, no dressing will be necessary. After fourteen or eighteen days the eschar will fall off, and leave, instead of the tattoo-marks, a reddish, superficial cicatrix, which will gradually turn pale, and after two months will almost disappear.

Chloroborate of Sodium.

A NEW antiseptic has recently been put on the market in Europe, under the name *Natrium Chloroborosum*, which might be rendered in English, "chloroborate of sodium." This is said to be a chemical compound, obtained by the action of soda upon boron trichloride. Since the latter substance, however, is decomposed, when coming in contact with water, into boric and hydrochloric acids, and as it is, moreover, not quite easily prepared, it seems to us that the manufacturers probably use a solution of boric acid mixed with hydrochloric acid, and neutralize this with soda. A by-product of this manufacture has also been put on the market under the name *Barmenite* (being prepared in Barmen). This is recommended as a preservative of vegetable or animal food. Probably it is nothing else but ordinary chloride of sodium and boric acid, and for aught we know, the first-mentioned preparation may be merely an aqueous solution of these substances.

Preparation of Pure Pepsin.

DR. L. H. FRIEDBURG recently published a paper "On the Active Principle of Rennet, the so-called Chymosin" (in *Jour. Amer. Chem. Soc.*, X., 98 sqq.), in the course of which the author has occasion to refer to pepsin, and to show how the latter may be freed from chymosin. This results in the production of a pepsin which will not coagulate milk, while it retains its full digestive power. As there is certainly an advantage in freeing pepsin from any accompanying substance which is not essential to its action, the method below detailed affords the means of attaining a further degree of purity. Eventually, no doubt, some other bodies will be found accompanying even the purest pepsin of the present market, which are not essential to it, and for which a process of separation will be discovered.

Dr. Friedburg first quotes from a patent granted to M. Blumenthal, in 1886, for the preparation of chymosin, as follows:

"I have found that *chymosin*, the agent which coagulates milk,* may be obtained from rennet, or the stomachs of ruminants, and more especially that of the calf, which contains comparatively little pepsin, the chymosin preponderating; in the stomach of the pig or sheep, on the other hand, I have found that pepsin preponderates. Hence, if the chief product is to be *chymosin*, it will be found of advantage to employ the stomach or rennet of the calf as a raw material; and if *pepsin* is to be the chief product, it will be of greater advantage to employ the stomach or rennet of the sheep or pig.

"The treatment of the raw material being the same, whether the stomach of the pig or that of the calf or other ruminant is employed, I will confine this description to the treatment of the stomach of a calf, with a view to obtaining chymosin as a principal, and pepsin as a by-product. The stomach of the calf is cut into small pieces, and macerated or digested for about twenty-four hours in a solution, preferably of common cooking-salt, containing about 0.5 per cent of salt, kept at a temperature of 30° C., more or less. The solution is then filtered, and a small amount of mineral acid—such as hydrochloric, sulphuric, or phosphoric acid—is mixed therewith, in the proportion of about 0.1 per cent. The reaction of the acid on the saline solution gives rise to a thick precipitate of mucous matter, which contains but traces of chymosin and no pepsin, the solution during the acidulation being preferably kept at a temperature of about 20° to 30° C., as at that temperature the mucous matter agglomerates more rapidly or readily, and may, in this condition, be easily separated from the solution, which is effected only with the greatest difficulty otherwise. The filtered solution is again acidulated, to the extent of about 0.5 per cent of acid, and pulverized cooking-salt is added until a precipitate of the latter is formed.

"This supersaturated, acidulated salt solution is now brought to a temperature of 25° to 30° C., and kept at this temperature for two or three days under constant agitation and then allowed to rest for a day or so, the temperature being increased to 30 or 35° C. A separation then takes place in the form of a white, flocculent substance, which floats on or in the solution, and may be readily collected on a filter, and then dried at a temperature of about 28° C. The substance separated from the solution is the pure zymotic product called '*chymosin*.' It is an amorphous, white, gelatinous substance, greatly resembling aluminium hydrate, is without taste or smell, and soluble in water, forming a limpid or clear solution. It may be kept for years without deterioration, and is not injured by temperatures reaching as high as 35° C. The remaining saline, supersaturated, acid liquor or mother liquor, free from chymosin, does not cause milk to curdle when mixed therewith; the active agent, chymosin, which alone produces this reaction in milk, having been eliminated. The pepsin held in solution in this mother liquor may now be separated therefrom by neutralizing the solution with an alkali, and agitating the same for some time, the pepsin being obtained as a gelatinous precipitate, insoluble in the concentrated neutral salt solution, but soluble in the acid salt solution.

"Pure pepsin may be obtained from the so-called 'impure pepsin essence' or 'extracts of rennet of commerce,' by acidulating these extracts or the solution of the dry rennet with one of the mineral acids above referred to, in the proportion of about 0.2 per cent of the acid, whereby the impurities are precipitated. These are removed by filtration, an excess of cooking-salt added, as described, to separate the chymosin, which is collected, and the remaining solution is neutralized to precipitate therefrom the pepsin. In this case, also, chymosin and pepsin are separately obtained, free from any albuminous, mucous, or other impurities."

Dr. Friedburg then continues:

"Experiments which I performed myself at different times, working exactly according to the directions of this patent, convinced me of its value. Working on a small scale, and using about five calves' stomachs at a time, the

preparation of chymosin was performed successfully. The only difference from the results, as stated in the patent, is a very agreeable one, i. e., 'that on so small a scale the chymosin is obtained immediately after supersaturation of the acid solution by common salt (NaCl). A snow-white substance accumulates then, floating upon the liquid. It is even preferable at once to skim off this substance from the liquid and to put it on porous clay or a piece of glass, because it easily might be lost in the three to four days' consecutive standing of the liquid, either because the small amount of chymosin obtained sinks down to the surface of the salt, and is thus rendered inaccessible, or because under such conditions it might decompose.' I advise the removal of the white surface at once, and then letting the liquid stand to see whether the crop will be augmented after a few days, as the patent indicates."

In a previous portion of his paper, the author had quoted from an important paper published, in 1872, by Hammersten, in which our knowledge of the chemistry of milk coagulation was most materially extended. It is this paper which the author refers to in his subsequent remarks:

"Since I referred to Hammersten's remark that it seemed as if pepsin still, and *eo ipso*, had a slight power of coagulating milk, I made the following assay: Merck's pepsin was taken and freed from chymosin, according to the above-mentioned patent. The resulting pepsin, which was perfectly odorless, and dissolved to an almost absolutely clear liquid, digested albumen actively, while in a very slightly acid solution (HCl) it did not curdle milk within forty-eight hours, and this same milk would always curdle in the shortest time when, at the end of the above-mentioned period of the experiment, chymosin was added.

"It seems, therefore, that, according to the patent, the separation of chymosin from pepsin is more thoroughly arrived at than in Hammersten's fractional precipitation and consecutive heating of the substance to a temperature at which it is supposed that chymosin is destroyed. Besides, it would follow that, under such conditions (the pepsin of Hammersten actually showing the power of curdling), the chymosin is not fully destroyed.

"Pure pepsin, free from chymosin, does not curdle milk, according to my experiments."

Estimating the Activity of Pepsin.

THE method usually adopted for estimating the peptonizing power of pepsin consists in dissolving 1 to 2 grains in 8 to 12 ounces of water, to which 40 to 60 minims of hydrochloric acid has been added. 500 to 1,000 grains of hard-boiled white of egg, granulated by rubbing through a wire sieve, is immersed in the liquid, and the whole kept at 98° to 130° F. for four hours, when the undissolved albumen is filtered off through muslin, and, after partial drying, is weighed to ascertain the amount dissolved. The variable numbers above quoted embrace various formulæ recommended by different experimenters.

This method of analysis is excessively crude and untrustworthy. When hard-boiled white of egg is kept in warm water, it absorbs a considerable quantity of that menstruum, as much as several units per cent; consequently, on weighing the residual albumen, you may find that the weight is greater, instead of less than that with which you started, the gain in weight due to absorbed water more than counterbalancing the loss obtaining through solution, as has happened with indifferent samples of pepsin. Then who shall say when, by simple air drying, the albumen has regained its former condition? The enormous quantity of albumen is foreign to the usual habits of the scientific analyst, and involves an enormous waste of time in manipulation.

One trial of this method was enough for me. The first modification I adopted consisted in substituting for the large quantity of granulated albumen a single half of the white of an egg in one piece. I likewise arranged a check experiment in which the pepsin was omitted, other conditions remaining unaltered. At the end of four hours the residual pieces of albumen were placed on blotting-paper to remove superfluous moisture, and weighed. The gain in weight of the albumen in the check experiment, due to absorbed water, was calculated into percentage, and the same deducted from the weights of the other portions which had been subjected to the action of various pepsins. This, although an improvement upon the old method, proved likewise unreliable, because the water absorbed was not equal in each experiment. The albumen which was immersed in acidulated water only, quickly dried, superficially, when placed on blotting-paper; whereas that which had been acted on by pepsin was rendered glutinous and incapable of being dried in this manner. In fact, one sample weighed considerably more than it did at starting, even after deducting the allowance for water absorbed.

I next tried much smaller pieces of albumen, in hope that complete solution might ensue, and a time value be obtained. I soon found, however, that the solubility does not depend upon the mass, but upon the surface exposed.

Finally I discarded altogether the use of fresh white of egg, and had recourse to dry powdered albumen, prepared by drying in a steam oven and levigation in a mortar. With this I succeeded in getting accurate comparisons between the digestive powers of various pepsins. Albumen

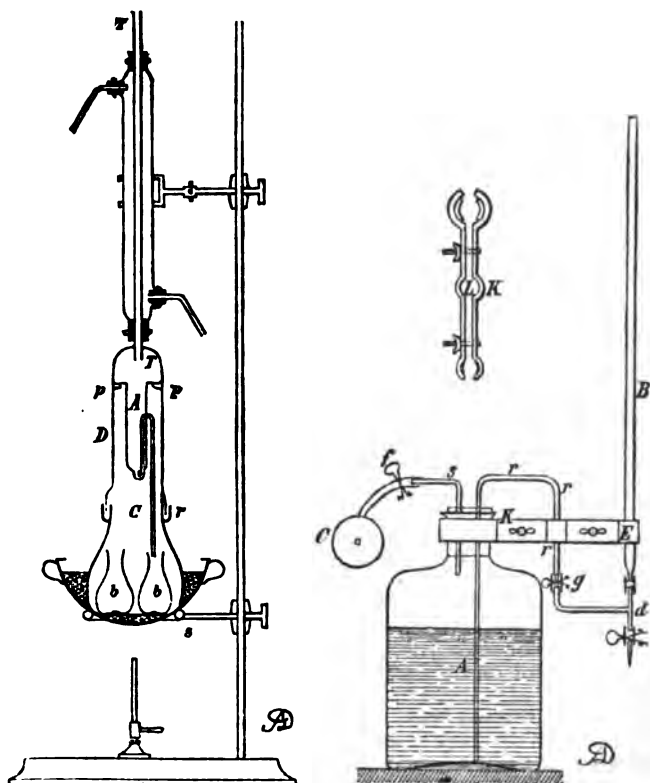
* We have worded this thus, in place of the author's version: "the active agent in milk," which almost reads like "the active principle in, or of, milk."

in this form dissolves with rapidity, owing to its state of fine division. Any remaining undissolved can be filtered off on a counterpoised filter paper, and heated in a water oven until absolutely dry. It is, however, unnecessary to do this when two samples only are compared against each other, nor is it essential to know the actual weight of albumen employed, provided it be the same in each experiment. This is insured by placing some on the naked pan of the balance (there is no objection to so doing, as it is a dry gritty powder, and does not adhere to the metal), and counterpoising by a similar addition to the other pan.

Let the albumen fall on the centre of the filtered liquid, avoiding, if possible, contact with the glass of the beaker. It soon sinks, and after the lapse of some time, a simple inspection will show which is dissolving with the greater rapidity. Agitation assists solution, therefore take the two beakers, one in each hand, and rotate the contents equally. When one sample has dissolved all the albumen, it is manifestly superior to the other which has failed to do so in the given time. If many samples have to be compared, it will be necessary to start with known quantities of albumen, and weigh the undissolved residues in the manner above indicated.

An objection may possibly be raised to this modified method, viz., that albumen as ingested is not in the form of a dry powder, and that we ought to copy as nearly as possible the conditions existing in the stomach; but, since there is no absolute test for pepsin, we can only compare one sample against another, and that which dissolves the most albumen in a short time is taken to be the best.

Another imperfect method of analysis is that employed in the examination of malt extracts for diastase; in which



Graftian's extraction apparatus.

Knoeffler's titration apparatus.

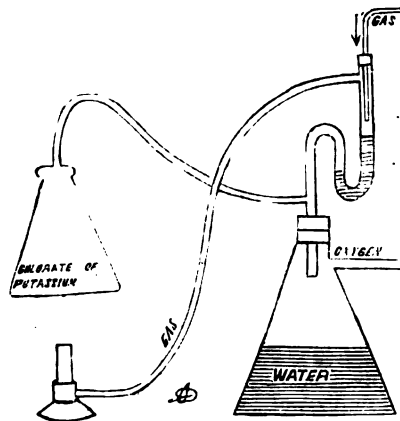
a certain weight of extract ought to dissolve a certain weight of starch in ten minutes, when, if it does so dissolve it, the extract is a good one; if not, it is to be condemned. The more correct way is to ascertain the reducing power on Fehling's solution, before and after digestion with an excess of starch, and I intend to say a few words upon this subject on a future occasion, when I have ascertained the maximum amount of diastase existing in the best samples of malt.—A. PERCY SMITH, in *The Analyst*, 1888, 152.

Purifying Cotton-Seed Oil.

At present it is customary to remove the coloring-matter from crude cotton-seed oil by agitation with caustic soda; this reagent, however, causes the loss of 3 to 7.5 per cent of oil, which is retained in the mucilage. G. Tall and W. P. Thompson (Engl. Pat. 15,647) substitute normal sodium carbonate for the caustic soda, that being without action on the oil itself, though capable of extracting the coloring matter. When the bulk of the coloring matter has been dissolved out by this means, any remaining traces, together with a disagreeable taste which is apt to cling to the oil, are removed by treatment with Fuller's earth at 300°–50° F. The coloring matter can afterwards be used as a dye either in the alkaline solution or after precipitation, preferably, with hydrochloric acid and re-solution in an alkaline menstruum. When exhausted, the Fuller's earth can be regenerated by boiling with sodium carbonate, washing, and drying at about 300°–400° F.—*J. Soc. Chem. Ind.*

REGULATOR FOR OXYGEN GENERATORS.

POLLACK and WILDE recommend the arrangement shown in the accompanying schematic illustration for regulating the production of oxygen from chlorate of potassium, or that of other gases which are generated by the aid of heat. The copper vessel in which the chlorate of potassium is heated is connected, by means of tubing, with a receiver half filled with water, in such a manner that the generated oxygen gas enters one leg of a manometer charged with mercury, which is intended to regulate the supply of coal-gas to the burner. When the volume or pressure of oxygen becomes too great, it will cause the mercurial column in the other leg of the manometer to rise and more or less obstruct the orifice of the tube conveying the coal-gas. The flame under the burner will thereby be made smaller, and will only blaze up again when the pressure inside of the apparatus diminishes.—*Chem. Zeit. and Pharm. Centralh.*



Pollack's and Wilde's gas-regulator.

[In the cut, the inner leg of the manometer tube, which enters the flask containing the water, does not dip below the surface of the latter, to prevent the water from being aspirated back into the generating flask, in case the external pressure should become greater than the internal. If the gas is to be washed, a sufficiently large empty flask should be interposed next to the generator. Should any liquid from the succeeding flasks be aspirated backwards, this would be caught by the interposed flask.—*Ed. AM. DRUGG.*]

AN IMPROVED EXTRACTION APPARATUS.

IN the apparatus here described, the extraction vessel D is open below, and is placed with its ground and expanded open end into a flange around the edge of the receiving vessel. The latter contains several receiving flasks, which may be utilized in rotation by merely turning the extractor so as to bring the siphon tube descending from the percolator A over the corresponding flask. A is inserted from below and made to rest, by a horizontal flange, upon projections, p p, inside of the extraction vessel. In all other respects, the apparatus may readily be understood without further description. It has been devised by J. Graftian.—*Chem. Centralbl.*

IMPROVED TITRATION APPARATUS.

WHEN the same volumetric solution is to be used frequently, an apparatus, like that shown in the cut, proposed by O. Knoeffler, will be found serviceable.

In this apparatus, the burette B is permanently connected with the reservoir containing the volumetric solution by a series of bent tubing, starting with a T piece at d. At g, a pinch-cock is placed. The burette and connecting tubing are firmly held by a clamp K, which is separately figured. C is a rubber ball, by means of which air can be forced into the reservoir so as to produce enough pressure to cause a filling of the retort, to any desired height, whenever the stop-cock g is opened.—*Chem. Centralbl.*

Cure of Corns with Carbolic Acid.

GUPLER (*Comm. Thérap. du Codex*) states that carbolic acid is a much more powerful escharotic than creosote, and that, in a concentrated state, it has the effect of tanning and corroding the skin. Dr. Salemi, of Nice, has taken advantage of this property, for the purpose of curing a corn which several other remedies had failed to remove. He gives the following directions: After bathing the feet in soapy water, dry the affected part. Melt the carbolic crystals by a gentle heat, and apply a thickish layer over the softened surface of the corn, taking care not to touch the surrounding sound skin. After a few minutes, apply to the layer of acid a piece of wadding, or blotting-paper, to absorb the excess of the acid. Before applying the acid surround the corn with a stout layer of collodion. Repeated at intervals of three or four days, this simple remedy is stated to effect a complete cure.—*Chem. and Drugg.*

Dr. Wurster's Tetra-Paper.

In an article on the detection of free hydrochloric acid in the stomach (see page 30 of this number), we mention Dr. Wurster's "tetra-paper, that is, paper impregnated with tetramethyl-paraphenylene-diamine." As this paper is likely to be in some demand for the estimation of the oxidizing power of various substances, we reproduce here an article on the subject from the *Australasian Journ. of Pharm.* (1888, 391):

We are indebted to M. Paul Guticke, the representative of Dr. Theodor Schuchardt, of Goerlitz, Prussia, for the following directions for the use of the color scale for Dr. C. Wurster's tetra-paper:—By means of this scale, the oxidizing power of liquid, gaseous, as well as solid substances, even if the latter be only present in the smallest quantity, can be determined in a few moments.

Tetramethyl-paraphenylene-diamine is used as a reagent because this base, on oxidation, by means of one atom of oxygen, is transformed to a violet coloring matter, which latter again will be completely destroyed by means of six further atoms of oxygen.

This formation of coloring matter, as well as its destruction, may be used as an exact measure of oxidizing power, because seven times as much oxygen is necessary for the destruction of the coloring matter so formed as is required for the formation of coloring matter from the original tetrabase.

The intensity of the different shades of the scale was obtained by means of iodine solutions of which one or two drops sufficed to develop the color.

A normal iodine solution corresponds to the shades of the color scale.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
and contains accordingly milligr. of active oxygen per liter.	22	16	8	3.2	1.6	0.8	0.24	0.08
or, reckoning 16,000 drops to a liter, milligr. of active oxygen per drop	0.002	0.001	0.0005	0.0002	0.0001	0.00005	0.000015	0.000005

No.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	of the color scale or normal iodine solution corresponds to milligr. of active oxygen per liter of normal solution or in 1,600 liters of air.
32	16	8	3.2	1.6	0.8	0.24	0.08		

To carry out the test, one or two drops of the liquid to be tested are allowed to fall, by means of a glass tube, upon the test paper folded once and preferably placed upon a white surface. The paper is then again folded, slightly pressed together, and after a few minutes compared with the scale. The Roman figure above the corresponding shade indicates the amount of active oxygen, as given in the directions.

Remarks.

1. If the fluid to be tested is of alkaline reaction, the test paper should be previously moistened with a drop of acetic acid. Solid bodies must be finely powdered and suspended in water.

2. In case a complete decoloration of the paper occurs, which may result from further oxidation or too acid a solution, the liquid to be tested must be diluted with several times its volume of water or acetic acid.

3. The process is adapted not only for testing oxidizing liquids in weak acid solutions, but also for the investigation of animal and vegetable secretions, as saliva, pus, etc.

4. This scale may also be used for testing the oxidizing power of the air, whether it be the ozone of the outer atmosphere, or the nitrous acid produced by the burning of illuminating gas.

5. Liquids in test tubes before comparison with the scale must be diluted with four times their volume of water or acetic acid.

6. An apparatus according to the directions of Dr. Wurster, for the quantitative determination of the oxidizing power of the air, together with a color scale, directions and all necessary implements with a case may be obtained for 20 marks—scale and directions alone for 5 marks—from the chemical works of Dr. Theodor Schuchardt, Goerlitz, Prussia.

Dr. Wurster's directions for the determination of the oxidizing power of the air.

The tetra-paper, double or single, is stretched over the open end of a long or short glass tube of 0.6 Cm. diameter and fastened by a rubber band. In very dry air the paper is moistened with diluted glycerin. The other end of the glass tube is connected with a rubber ball suction-apparatus. By compressing the ball, the air is forced through the valve, while by its expansion fresh air is sucked through the test-paper at the other end of the tube.

One liter of air drawn through the paper corresponds to twenty expansions of the ball. On an average, the passage of five to twenty liters of air will suffice to develop a distinct degree of color in the paper. The colored portion of the paper is then cut out, moistened with a drop of diluted glycerin, laid upon a white surface, and compared with the shades of the scale.

Supposing a liter contains 16,000 drops, it follows that the color corresponds to one drop of iodine solution, or 0.002, 0.001, 0.0005, 0.0002, 0.0001, 0.00005, 0.000015, 0.000005 milligr. of active oxygen in one liter of air.

Removal of Ammonia from Sulphuric Acid.

MELDOLA and Moritz have recently proposed a method for freeing sulphuric acid, which is to be used in Kjeldahl's process for determining nitrogen, from ammonia. They propose to add nitrite of potassium and to heat for some time. Prof. G. Lunge, however, points out (in *Zeitsch. f. angew. Chem.*, 1888, No. 23) that neither the supposed impurity nor the method of purification corresponds with the actual facts. The principal constituent which contains nitrogen, and appears as an impurity in sulphuric acid, is the nitrosyl-sulphuric acid (chamber crystals, nitrosulphonic acid, $\text{SO}_3 \cdot \text{HO} \cdot \text{NO}$), and this is usually destroyed, previous to the concentration of the acid in platinum vessels, by the addition of ammonia. Sometimes the latter is not added in sufficient quantity. Hence not only ammonium salts, but also some undecomposed nitrosulphonic acid may be present. Regarding the process of purification, Lunge points out that it is impossible to remove nitrous from sulphuric acid when the latter is heated with nitrite of potassium.

Lunge recommends to test each lot of sulphuric acid separately for the amount of nitrogen compounds it contains, and to correct the result obtained by means of the same test from the nitrogen compounds subjected to assay, by deducting the amount previously found in the acid itself.

New Process for Soluble Ferric Oxide.

DR. L. PESCI, of the Livorno Naval Academy, having observed that when a solution of ferric chloride is mixed with one of potassium nitrite, nitrogen binoxide is evolved, and a soluble ferric oxide formed, has proposed the following mode of preparation. Into a flask provided with a stopped funnel and two glass tubes, one of which reaches to the bottom, a solution is introduced of potassium nitrite, obtained from silver nitrite and potassium chloride. The air in the flask having been driven out by means of a stream of carbonic acid, a solution of ferric chloride is introduced through the funnel, in the proportion of one molecule for eight molecules of nitrite. Much gas is at once evolved; a washing through caustic potassa to absorb the carbonic anhydride shows it to consist of pure nitrogen bioxide. The flask contains hydrated ferric oxide suspended in a colorless liquid, from which it may be separated by filtering. The filtrate proves to hold, among other products, some nitrous acid, resulting from the excess of potassium nitrite purposely employed. But this feature of the operation-theory need not be further entered into. The ferric oxide left on the filter is now purified by washing with distilled water, either on the filter itself or in a dialyzer. When completely freed from all traces of saline impurities, it becomes soluble in water, and presents the following properties. After boiling with pure caustic soda, it proves to contain no chlorine and no nitric or nitrous acids. Its solutions afford no precipitate with either potassium ferrocyanide or sulphocyanide; with tannin a brown coloration, followed by a slight precipitate, is observed. The addition of an alkali salt causes the hydrate to coagulate. With acetic acid no precipitate is formed, but the liquor turns brown-red, and on adding an alkali salt—sodium chloride, for example—the ferric hydrate is thrown down again with all its characteristics. Concentrated nitric or muriatic acid causes a temporary precipitate, which soon redissolves and presents the usual reactions of ferric salts. On boiling, the ferric hydrate solution becomes turbid, and lets down brown-red flakes, which redissolve on cooling. The solution, when tested with naphtho-phenol or rosolic acid, has an acid reaction. It seems to keep unaltered for a long time. Taken altogether, the properties of the ferric oxide obtained by the foregoing process appear to prove the compound to be a meta-ferric hydrate. Indeed, all the characteristics described above exactly correspond to those indicated for the compound in question by MM. Pean de Saint-Gilles, Scheurer Kestner, and Debray at various times. A slight modification of the process would probably afford a practical method for preparing "dialyzed iron" without dialysis.—*Chem. and Drugg.*

Antiseptic Saccharin Dentifrice.

DR. CONSTANTIN PAUL gives the following formula for an agreeable dentifrice:

Saccharin.....	90 grs.
Sodium Bicarbonate.....	60 "
Diluted Alcohol.....	4 fl. oz.
Oil of Peppermint.....	20 drops
Tincture of Cochineal.....	q. s.

—After *Chem. and Drugg.*

Testing Commercial Alcohol for Purity.

H. BORNTÄGER publishes a scheme for testing the purity of commercial alcohol, more particularly such as contains aldehyde, acetal, or amylic alcohol. These impurities are liable to occur in much larger quantity in alcohol manufactured in Europe than in that made in this country, as the chief source of alcohol in Europe are potatoes. However, the ordinary commercial grades of alcohol are here also liable to contain the before-mentioned impurities. For this reason, an abstract of H. Bornträger's paper will be practically useful.

The following reactions characterize *aldehyde*, *acetal*, and *amylic alcohol*, when they are either pure or dissolved in not too much alcohol.

Aldehyde: Boiling point, 21° C.; spec. grav., 0.807; easily soluble in water.

Acetal: Boiling point, 104° C.; spec. grav., 0.821; insoluble in water.

Amylic Alcohol: Boiling point, 132° C.; spec. grav., 0.825; insoluble in water.

[Note.—In the following text, *aldehyde* will be abbreviated "*al*"; *acetal*—"*ac*"; *amylic alcohol*—"*am*."—*ED. AM. DRUGG.*]

1. Behavior towards chloroform:

Al is taken up by it, then sinks to the bottom, and increases the volume of the chloroform. *Ac* and *am* behave similarly.

2. Behavior towards ammoniacal solution of silver and warming:

Al—a handsome silver-mirror deposit; *ac*—no mirror, but a trace of silver reduced; *am*—no action.

3. Behavior towards a colorless aqueous solution of fuchsine and bisulphite of sodium:

Al—deep-violet color, changed to blue by concentrated hydrochloric acid (sensitive to 1 in 500,000); *ac* and *am*—no color.

4. Behavior towards an equal volume of concentrated sulphuric acid:

Al, *ac*, and *am*—deep-brown color.

5. Behavior towards an equal volume of strong solution of potassa (1 : 3):

Al, *ac*, and *am*—yellowish color.

6. Behavior towards an equal volume of concentrated sulphuric acid, and afterwards adding concentrated solution of potassa:

Al—copious separation of carbon, and faint odor of acrolein; *ac*—strong odor of acrolein; *am*—colorless liquid of agreeable odor.

7. Behavior towards 3 drops of concentrated hydrochloric acid and 10 drops of colorless aniline ("aniline-oil"):

Al—yellowish-brown color (when much *al* is present); *ac*—no color; *am*—handsome raspberry color (with as little as 0.05 per cent).

8. Behavior upon dilution with 2 parts of water, shaking with chloroform, separating the latter, and adding to it 3 drops of concentrated hydrochloric acid, and 10 drops of colorless aniline:

Al—the chloroform assumes a yellowish color (traces cause no color); *ac*—no color; *am*—the chloroform assumes a deep-red color when much *am* is present; with traces, it assumes a rose-red tint.

9. Behavior towards concentrated solution of iodide of potassium:

Al—brown color; *ac* and *am* no color.

These color reactions are best performed in a small, white porcelain capsule.

As many of these reactions will fail when only traces of the impurities are present, some method of extraction has to be practised, in order to reveal their presence. The author recommends the following:

I. Dilute a portion of the alcohol with much water, and observe whether any droplets collect on the surface of the latter. If this is the case, remove them and test them with sulphuric acid and potassa (see above, § 6: acrolein-odor) for acetal, and for amylic alcohol with hydrochloric acid and aniline (§ 7).

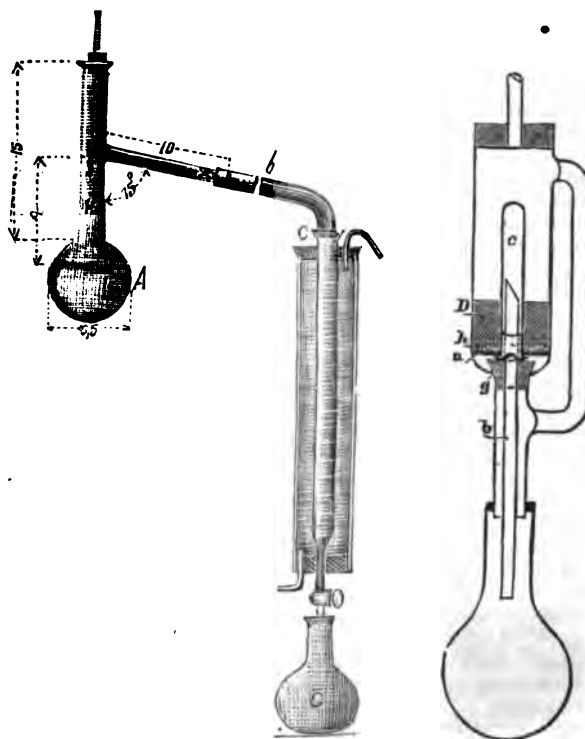
Another portion is tested for aldehyde with iodide of potassium, fuchsine, and bisulphite of sodium (§§ 9 and 3). Traces of aldehyde are found in every alcohol.

II. If no drops separate on dilution, apply the tests for aldehyde, as in the preceding paragraph. Another portion is diluted with 2 parts of water, the solution shaken with a little chloroform, and the residue left after evaporation of the latter tested for acetal and amylic alcohol, as above.—After *Zeitsch. f. anal. Chem.*, 1889, 60.

FRACTIONAL DISTILLATION.

IN connection with an article on the varieties of German petroleum, Prof. Dr. C. Engler describes his method of fractional distillation which is distinguished by several features of novelty and utility.

He employs a flask A, of a diameter of 6.5 Cm. (2½ inch.), with a neck 15 Cm. (6 inch.) long and 1.5 Cm. (1½ in.) wide. These and the other dimensions are given in the cut in cubic centimeters. The lateral delivery tube is connected with the copper tube b, 1 Cm. wide and altogether 45 Cm. (18 in.) long, and this dips into a stoppered burette cooled by water. The distillate is received in a flask C. If 100 C.c. of the liquid are used for every distillation, and the operation is so conducted (at least in the case of petroleum) that between 2 and 2.5 C.c. pass over every minute, the several fractions may be separated by taking away the source of heat whenever any desired point of the thermometer has been reached, allowing the temperature to fall by at least 20° C., and then again heating to the point previously attained until nothing more passes over at this temperature. The distillate is then removed, and a new fraction driven over by a suitable increase of the temperature.—After *Dingler's Polyt. J.*, 267, 511.



Engler's fractional still.

Schmidt and Haensch's extraction apparatus.

EXTRACTION APPARATUS.

FRANZ SCHMIDT and HAENSCH, of Berlin, have patented the extraction apparatus here shown.

Through the stopper g passes an adjustable dripping tube, obliquely cut off at its upper end. It is surrounded by a well-tube, c, fitting quite closely, so that liquid will ascend between the walls of the two tubes by capillary attraction. The well-tube is somewhat widened and dented at the bottom, so as to afford a support and to admit the liquid. At is placed a finely perforated disk, and upon this a filter, h, upon which is placed the substance to be extracted.

The arrangement just described offers the advantage that the substance is kept constantly under the liquid, and that only a small amount of this is required.

Camphoric Acid.

CAMPHORIC acid has been recently strongly recommended by Professor Reichert as useful in the treatment of acute and chronic affections of the respiratory passages. Externally he has used solutions containing from ¼ to 6 per cent of the acid, and has observed that, when applied to the mucous membrane, it appears to exercise a constricting action within two minutes, and that, besides its antiseptic properties, it promotes granulation without irritation. He recommends, in acute angina, the use of a ¼ to 1 per cent solution every three hours; in pharyngo-laryngitis and tracheitis, the application, as a spray, of a ¼-per-cent solution, increasing in strength to 1 per cent; in acute catarrh, the introduction of wadding saturated with a 2-per-cent solution into the nose; in acute bronchitis, a 1 to 2 per cent solution applied as a spray to the larynx. Camphoric acid forms white crystalline needles, having an acid taste; it is difficultly soluble in water, and readily soluble in alcohol, ether, or fixed oils (2 per cent). In order to prevent it from crystallizing out from concentrated aqueous solutions, it is advisable to add about 11 per cent of alcohol.—*Pharm. Journ.*

Detection of Minute Traces of Arsenic.

SCHLICKUM states that, if a minute crystal of sodium sulphite is placed in a solution of 0.3 to 0.4 gramme of stannous chloride in pure hydrochloric acid (sp. gr. 1.124), there is liberated, not merely sulphurous acid, but sulphuretted hydrogen, the latter owing to the reducing action of the tin-salt upon the sulphurous acid. If a hydrochloric acid solution or white arsenic is cautiously poured over it, there appears, if only $\frac{1}{2}$ milligramme of arsenious acid is present, a yellow ring of arsenic sulphide at the line of junction of the two liquids.

This ring gradually increases upwards, and if $\frac{1}{2}$ milligramme is present, it colors the entire upper stratum of acid yellow in the course of a few minutes. With arsenic acid, the reaction requires a little longer.

The method succeeds in presence of bismuth and antimony, as the sulphides of these metals do not form in a strong hydrochloric solution.—*Pharm. Zeit.*, abstr. in *Chem. and Drugg.*

A new Test for free Hydrochloric Acid in the Stomach.

VARIOUS tests have heretofore been recommended for detecting or estimating free hydrochloric acid in the contents of the stomach, but of the qualitative tests only a few are really of practical use, and of the quantitative ones those which give reliable results consume too much time.

As is well known, it is often of importance for the physician to ascertain the proportion of hydrochloric acid in the stomach. In some cases, its total or nearly total suppression is an important help to diagnosis. With a view of simplifying the process of assay, so as to enable the practitioner to perform it himself, John Sjögqvist proposes a new method which is based on Mohr's volumetric estimation of barium by means of bichromate of potassium.

If a solution of bichromate of potassium of known strength is gradually added to the solution of a barium salt, to which (in the case of the chloride) some sodium acetate and free acetic acid is added—to prevent the separation of free hydrochloric acid—there will be formed a precipitate of chromate of barium, soluble in hydrochloric acid, but *insoluble* in water or acetic acid. As long as the bichromate solution has not been added in excess, the liquid over the precipitate, after this has subsided, will show no trace of tint. But the least excess will produce this. However, as it requires time for the precipitate to subside, so as to recognize the tint of the supernatant liquid, the author recommends to use a special test-paper which shows even traces of bichromate. This is Dr. C. Wurster's ozone test-paper or *tetra-paper*, prepared by impregnating paper with tetramethyl-paraphenylenediamine. Originally, this was proposed as a test for ozone, but bichromate of potassium in presence of acetic acid likewise acts as a sufficiently strong oxidizer to produce the reaction, which consists in the paper turning *blue*. In executing the test, the liquid in the beaker is mixed with about one-fourth of its bulk of alcohol, to cause the precipitate to deposit more rapidly. The test-liquid is added as long as a precipitate is seen to form. When this is no longer possible, a drop or two of the liquid is put upon a strip of the before-mentioned test-paper laid upon glass resting on white paper. If no blue tint makes its appearance after a few seconds, more bichromate is allowed to flow in, until, after renewed testing, the blue tint appears.

For carrying out the test the following solutions are required:

1. Solution of pure chloride of barium, containing 12.2 Gm. in 1 liter. On evaporating 50 C.c., and gently igniting the residue, this must weigh 0.52 Gm. If it varies from this, the original solution must be adjusted to this strength.
2. A solution of bichromate of potassium, made by dissolving 8.5 Gm. of this salt in water to 1 liter, and then finding its volumetric value when tested against the chloride of barium solution.
3. A 10% solution of acetate of sodium, mixed with 10% of acetic acid.
4. Alcohol.

Let it be assumed, for example's sake, that 9 C.c. of the bichromate solution exactly and completely react with 10 C.c. of the barium solution. Then each C.c. of the bichromate solution corresponds to 0.0104 Gm. of chloride of barium, or to 0.00405 Gm. of hydrochloric acid (HCl). The actual assay of gastric juice, or other liquid containing small quantities of hydrochloric acid, is performed as follows:

Put 10 C.c. of the filtered juice or liquor into a small platinum or silver capsule, add enough pure carbonate of barium (free from chloride) to have it in slight excess, evaporate to dryness, and ignite the residue for a few minutes. Allow the carbonized residue to cool, add 10 C.c. of water, incorporate or triturate this thoroughly with the carbonized mass, and heat to boiling. Filter through a small filter and wash the residue until 50 C.c. of filtrate are obtained. To this add 12 C.c. of alcohol, and 4 C.c. of the acetate solution. Now titrate with the bichromate solution until the *tetra-paper* turns blue. Each C.c. of the bichromate solution indicates 0.00405 Gm. of hydrochloric acid.—*After Zeitsch. f. physiol. Chem.*, 13, 1.

Average Composition of Normal Human Urine.

Yvon and Berlioz, of Paris, have made an extended series of experiments to determine the average, and also the minimum and maximum figures representing the principal constituents or physical properties of *normal* human urine. Their results differ somewhat from those given by other authorities.

It is to be observed, however, that such differences are probably based upon natural variations, due to different climate, different personal or national habits of living, and different constitutional functions. It is by no means a necessary conclusion that the average figures obtained from urine of healthy persons living, say, in Denmark, or in Anatolia, will be identical with those obtained from inhabitants of Norway, Central France, or Tropical Africa.

1. Quantity in 24 hours:

	Mean.	Minimum.	Maximum.
Male,	1.813 C.c.	1.185 C.c.	1.440 C.c.
Female,	1.125 "	935 "	1.375 "

2. Density:

Male,	1.024	1.019	1.027
Female,	1.0215	1.0175	1.0245

3. Urea:

Male, per liter,	21.70 Gm.	15.90 Gm.	26.21 Gm.
" in 24 hours,	26.52 "	21.24 "	30.95 "
Female, per liter,	19.28 "	15.52 "	25.55 "
" in 24 hours,	20.61 "	15.92 "	25.14 "

4. Uric acid:

Male, per liter,	0.500 Gm.	0.334 Gm.	0.638 Gm.
" in 24 hours,	0.596 "	0.4555 "	0.751 "
Female, per liter,	0.548 "	0.387 "	0.740 "
" in 24 hours,	0.566 "	0.5155 "	0.775 "

5. Phosphoric acid:

Male, per liter,	2.574 Gm.	2.105 Gm.	2.963 Gm.
" in 24 hours,	3.191 "	2.617 "	3.679 "
Female, per liter,	2.371 "	1.929 "	2.982 "
" in 24 hours,	2.590 "	2.126 "	3.166 "

—After *Arch. de Pharm.*, 1888, 485.

Chilblains.

AN interesting correspondence has recently taken place in the *British Medical Journal* regarding the treatment of chilblains. While some of the correspondents consider that no general plan of treatment may be relied upon as promising success, and lose themselves in generalities or propose remedies not accessible to people in this country, others give more practical advice.

One of them says that the socks or stockings should be of wool and not too thick. They should be thoroughly dry when put on, and changed as soon as they become damp, either from perspiration or from moisture leaking through the shoes. For this reason, the socks should be changed immediately after taking exercise, and the same shoes or boots should not be put on again unless they are quite dry. The same pair of socks should not be worn for two consecutive days, but each pair should be washed, or at least thoroughly dried, before being worn a second time. On no account are the socks to be allowed to dry on the feet, and the practice of putting the feet before the fire is to be condemned. Chilblains are most prevalent when the weather is both cold and damp. . . . It is important to insist upon regular exercise and a moderate diet, and to sedulously prevent constipation. For the immediate relief of itching nothing is better than soaking in hot water. Iodine is the best external application. It should be applied—either as an ointment or tincture of twice the ordinary strength—once or twice daily, as long as the skin remains swollen or red.

Dr. Robert McBride thinks the following is most efficacious:

R Lin. Belladonnæ (Br. Ph.).....	3 2
Lin. Aconiti (Br. Ph.).....	3 1
Acid. Carb.	℥ 6
Collodii Flex.....	ad 3 1

M. To be applied with a camel's-hair pencil every night to the parts affected.

Dr. G. E. J. Greene has found the following application a useful one, even when the chilblains are broken:

R Olei Ricini,	
Olei Terebinth.,	
Collodii Flex....	ad 3 4

M. To be used twice or thrice daily.

Dr. B. Nicholson speaks very highly of the following:

R Spir. Camphor.	3 2
Tr. Opii.....	3 2
Acid. Carb.	gr. 40
Alcohol.....	3 4
Aque.....	3 4

If the skin is broken, this lotion may be diluted with water and applied on lint or with a soft rag.

Another writer states that, if the chilblains are painted with equal parts of compound tincture of iodine and collodion, three or four times, considerable benefit will follow. He has never known this treatment to fail since he first tried it, some ten years since.—After abstract in *Chem. and Drugg.*

SPECIFIC GRAVITY OF INSOLUBLE SUBSTANCES.

THE process usually described in text-books is unnecessarily complicated. If a sufficient supply of material is at hand, a block may be cut of suitable size and shape ($4 \times 4 \times 1$ Cm.) to be held in a wire clip, such as is used for holding watch glasses together. In the case of wax, it is best to cut with a hot knife so as to avoid fissures. The substance is weighed first in air and then under water with the clip, which has been previously counterpoised, while suspended by a fine wire or hair, in water; the temperature is noted and we have all the required data. With smaller quantities, when the substances are lighter than water, the plan I adopt is as follows: A small funnel *F* is hung by a fine platinum wire to the specific gravity pan of a balance and counterpoised when floating in water, together with a 10-gramme weight placed on the pan. If the substance to be examined is wax, its surface is rendered smooth by holding for a few seconds in a Bunsen flame. The 10-gramme weight being removed, the wax is placed in its stead, and weights added until equilibrium is restored. The difference between the sum of these weights and 10 grammes is the weight of the substance in air. The wax is then held under water in the beaker *A*, and the air bubbles removed by means of a camel's hair pencil, an operation comparatively easy with a smooth surface; it is then slipped under the funnel *F*, which is again counterpoised. The excess of weight over 10 grammes added to the weight in air gives the loss of weight in water, and the specific gravity is deduced in the usual way.—W. H. SYMONS in *Pharm. Journ.*

THE DETERMINATION OF MELTING POINTS.

FOR technical purposes, in the case of most fats, it is sufficient to dip a thermometer in the melted substance, and then, rotating the thermometer in a horizontal position, to use the bulb as a mirror, and note the temperature at which it is no longer possible to see one's image clearly. Or we may observe the temperature at which the drop adheres to the bulb and rotates with it. If the thermometer is fitted with a cork to a test-tube the bulb may be protected from currents of air, and the indications rendered more delicate. This process really determines the solidifying point, and where that differs considerably from the melting point, as in the case of cacao butter, we may ascertain the latter by holding the arrangement at a suitable distance over a Bunsen flame. The bulb of the thermometer thus becomes a hot stage surrounded by an air-bath. The temperature is completely under control; and may be regulated to a fraction of a degree, over a very wide range. I find that results by this method are rather lower than those usually accepted as correct. For example, pure stearic acid melts when the thermometer indicates 88.5° C.; its melting point 69.2° C. Benzene, several times recrystallized, melts on the bulb at 3.9° C.; its melting point is stated to be 4.5° C. The thermometers used were of known accuracy.

In taking the melting points of ceresin, rosin, or mixture of these two substances, the above method was supplemented by the following modification:

A piece of thin spindle-tubing is enlarged at one end and drawn out and bent round U-shaped at the other. A small portion of the substance to be examined is placed in the wide end, which is afterwards loosely plugged with cotton-wool. Two or more such tubes can be attached to a thermometer, by means of a cork cut as shown in Fig. 2. The central hole takes the thermometer, and grips it sufficiently tightly to remain at any height it may be placed. The tubes, after being inserted, are twisted round so that the capillary tubes almost touch the bulb of the thermometer. The arrangement is then placed in a double water-bath, the inner vessel consisting of a small beaker partially filled with water, the outer vessel, not shown in the drawing, being a large beaker quite full of water. The water should have been recently boiled to remove air. The bath is heated until the substances melt; the source of heat is then removed, and while the bulb of the thermometer remains in the liquid the cork is shifted upward, so as to lift the tubes out of the water. The substances immediately solidify. When the temperature has fallen 5° C. they are re-immersed in the bath and the effect observed. The operation is repeated until the approximate melting-point is ascertained. Then the bath being again heated, more careful observations are made at every 0.5° , or oftener. By using a falling temperature, convection currents are in a great measure avoided.

For bodies which melt between 100° C. and 150° C., sulphuric acid may be used instead of water, and above this temperature fusible metal can be employed.

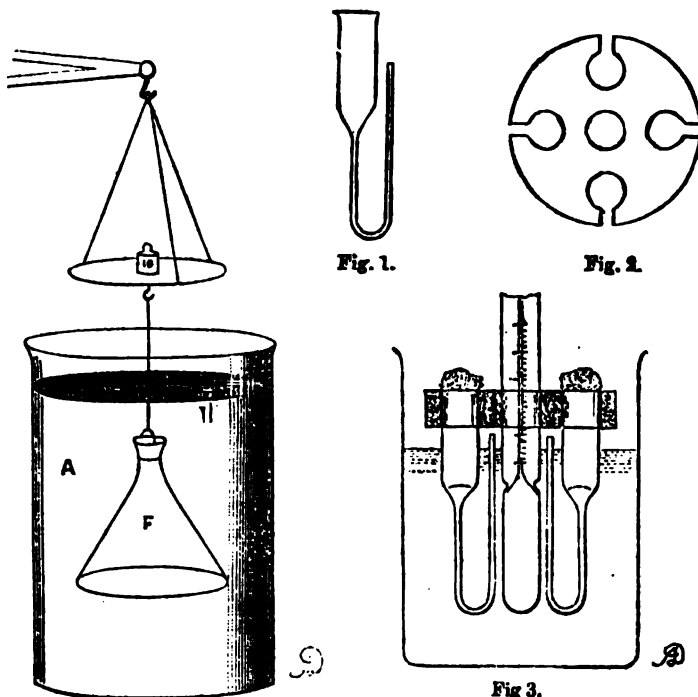
Neither this nor any other process with which I am acquainted gives absolutely satisfactory and comparable results when used with a substance which, like "paraffinum molle" of the Pharmacopœia, consists of a mixture of substances of varying melting points, for such a body, when heated to a temperature above its reputed melting point, and while the mass as a whole is undoubtedly fluid, still contains solid particles. On the other hand, a paraffin

wax, having a true melting point several degrees below that given for soft paraffin, is quite solid at normal temperatures.

In comparing melting points of such substances, it is sometimes useful to partially fill two similar tubes, and place above the fats quantities of mercury, noting the temperature at which the mercury forces the fats out of the tubes.—W. H. SYMONS in *Pharm. Journ.*

Production of Mercury in Russia.

THE *Handelsmuseum* states that in the year 1879 layers of quicksilver ore were discovered near the station Nikitowka, on the Kursk-Charkow-Asow Railway. In 1885, a company was formed for working this ore, and in April, 1886, the constructions required for the mine were commenced. The work has now entered upon the second year of its activity, and during this short time the results have already been so important that the production of quicksilver, this new branch of the mining industry of Russia, occupies already the position due to it among Russian mining undertakings. During the first year, 1887, the mine produced 3,911 poods of quicksilver, which was sent to the markets in the interior of Russia, gave complete satisfaction there, and caused the importation of foreign



1. Symons' specific gravity apparatus. Symons' apparatus for melting-point.

quicksilver to be discontinued to the same extent. The mine has been thoroughly explored, and the quantity of ore contained in it is fixed at exactly 12,000,000 poods, which, on an average of 1.2 per cent quicksilver produced therefrom, would represent a stock of 120,000 [144,000 ? Ed. AM. DR.] poods of quicksilver contained in this ore. All the ore is procured by means of dynamite, of which $2\frac{1}{2}$ pounds are used for every 1,000 poods of ore. The quicksilver obtained is taken to a special magazine, where it is purified by pressing it, under water, through linen. As soon as it is completely pure, it is poured into iron flasks each holding $84\frac{1}{2}$ pounds. These flasks are tightly closed by a screw stopper, provided with leads, and then brought into commerce. The *Russische Revue* states that the Russian quicksilver is uncommonly pure, and that its analysis proves that it contains no other metals whatever, which is a most valuable quality as regards all its technical uses.—*Com. Journ.*

Administration of Creosote.—Creosote forms a nauseous mixture, but Dr. J. Rosenthal states that with a little brandy and aerated water it is comparatively tasteless, and the disadvantages attending the administration of the remedy in a concentrated form are obviated.

Nickel.—There is said to be but one nickel mine in the United States which is extensively worked. This mine is in Lancaster Co., Pa. It has been worked for over twenty years, and developed to a depth of nearly 300 feet. The length of the lode is about 25,000 feet, and it produces about 500 tons per month, employing in its work about 200 men.

Note on Glucose in Urine.—George Rosenfeld agrees with many other observers in pronouncing phenylhydrazin to be the most reliable and sensitive reagent for glucose in urine. At the same time he points out that the absence of glucose, and therefore the non-existence of diabetes, is not demonstrated by any negative results with phenylhydrazin [or any other glucose test, since sugar does not always appear in the urine of diabetic patients]. A positive proof is obtained if the sugar reaction appears after the patient has partaken of wheat bread [or other starchy food].—*Deutsch. Med. Wochens.*

The Alkaloids of Cod-Liver Oil.

In our last issue, page 8, we gave an abstract of the results obtained by Gautier and Mourgues in their researches on cod-liver oil. It was stated there that two new bases had been discovered, viz., aselline and morrhaine, and the process of their extraction given. The authors have meanwhile published further facts relating to the properties of these bodies, of which the following is the essential portion:

After having separated, by distillation, the volatile alkaloids from the mixture of the crude bases liberated from their oxalates by an excess of potassa, there remains a brown matter which yields to ether fatty matter, etc., and the fixed alkaloids. The ethereal extract is slowly but almost completely soluble in weak hydrochloric acid. The resulting solution containing two hydrochlorates is treated with platinic chloride, which throws down an orange yellow precipitate, only soluble with heat, while the chloroplatinate of the other base remains in solution.

Aselline ($C_{12}H_{15}N_3$), in its free state, is a nearly colorless amorphous mass when kept in the dark, acquiring a greenish tint on exposure to light, not hygroscopic, and about of the spec. grav. 1.060. It melts to a yellowish viscid liquid of an aromatic odor "resembling that of the ptomaines." It is almost insoluble in water, but imparts to it a slight bitterness and feeble alkaline reaction. It is soluble in ether, and still more so in alcohol. With acids it forms crystallizable salts, which are partially dissociated by hot water.

This alkaloid exists in cod-liver oil only in very minute proportion. It is a very active substance, however; 3 milligrammes of its hydrochlorate causing the death of a greenfinch (verdier) in 14 minutes.

Morrhaine ($C_{12}H_{15}N_3$). This alkaloid is extracted from the mother-liquid remaining after the preceding one has been precipitated with platinic chloride. In its free state it is a very thick, oily liquid, of an amber color, and an agreeable odor, recalling that of lilacs. It is lighter than water, and easily soluble therein. Its best solvents are alcohol and ether. It has a strongly alkaline reaction, and leaves a caustic impression upon the tongue. On exposure to air it absorbs carbonic acid.

Morrhaine constitutes one-third of all the basic principles contained in cod-liver oil. A tablespoonful of the latter contains about 2 milligrammes of morrhaine, which is a quantity not without effect.

Morrhaine has the power to excite the appetite, and is also a diaphoretic and powerful diuretic.—After *Journ. de Pharm et Chim.*, 1888 (Dec.), 535.

Alum Baking Powders.

FROM a lengthy paper entitled "Experiments upon Alum Baking Powders and the Effects upon Digestion of the Residues left therefrom in Bread," by Prof. J. W. Mallet, of the University of Virginia, published in the *Chemical News*, we quote here the general summary of the results obtained:

1. The greater part of the alum baking powders in the American market is made with alum, the acid phosphate of calcium, bicarbonate of sodium, and starch.

2. These powders, as found in the retail trade, give off very different proportions of carbonic-acid gas, and therefore require to be used in different proportion with the same quantity of flour, some of the inferior powders in largely increased amount to produce the requisite porosity in bread.

3. In these powders there is generally present an excess of the alkaline ingredient, but this excess varies in amount, and there is sometimes found, on the contrary, an excess of acid material.

4. On moistening with water, these powders, even when containing an excess of alkaline material, yield small quantities of aluminium and calcium in a soluble condition.

5. As a consequence of the common employment of calcium acid phosphate along with alum in the manufacture of baking powders, these, after use in bread-making, leave at any rate most of their aluminium in the form of phosphate. When alum alone is used, the phosphate is replaced by hydroxide.

6. The temperature to which the interior of bread is exposed in baking does not exceed 212° F.

7. At the temperature of 212° F., neither the "water of combination" of aluminium hydroxide nor the whole of the associated water of either this or the phosphate is removed in baking bread containing these substances as residues from baking powder.

8. In doses not very greatly exceeding such quantities as may be derived from bread as commonly used, aluminium hydroxide and phosphate produce, or produced in experiments upon myself, an inhibitory effect upon gastric digestion.

9. This effect is probably a consequence of the fact that a part of the aluminium unites with the acid of the gastric juice and is taken up into solution, while at the same time the remainder of the aluminium hydroxide or phosphate throws down in an insoluble form the organic substance constituting the peptic ferment.

10. Partial precipitation in insoluble form of some of the organic matter of food may probably also be brought

about by the presence of the aluminium compounds in question.

11. From the general nature of the results attained, the conclusion may fairly be deduced that not only alum itself, but the residues which its use in baking powder leaves in bread cannot be viewed as harmless, but must be ranked as objectionable, and should be avoided when the object aimed at is the production of wholesome bread.

German Ichthyol (Thiol).

UNDER the name "thiol" or "German ichthyol," an artificially prepared representative of the natural ichthyol, now used to some extent in the treatment of skin disorders, has been introduced (*Apoth. Zeit.*, Dec. 19th, p. 1,056). It is prepared by heating "gas oil," obtained in the distillation of brown coal, with 10 to 15 per cent of flowers of sulphur, at a temperature of 215° C., under which treatment the unsaturated hydrocarbons of the C_nH_{2n} and C_nH_{2n-2} series are attacked. The thiosulphonic acid formed is separated from the undecomposed oil, and forms a dark-brown resinous mass, readily soluble in water, from which it is reprecipitated by mineral acids or salts. It is soluble in alcohol and ether, or better, in a mixture of the two. By neutralization of an aqueous solution with ammonia or soda solution, the corresponding salt of thiosulphonic acid is obtained, which is said to correspond to the corresponding combinations of the natural ichthyol. The sodium salt is represented as containing 12.1 per cent of sulphur.—*Pharm. Journ.*

Colorless Syrup of Hydriodic Acid.

THE National Formulary contains a formula for a colorless syrup of hydriodic acid, in which the preservative agent is a minute quantity of hypophosphorous acid. This formula has given universal satisfaction and yields a product far preferable to that obtained by the official process. Mr. Joseph W. England, who has likewise used the formula with satisfaction, has recently ascertained (*Am. Journ. Pharm.*, 1889, 14) that the hypophosphite or hypophosphorous acid may be replaced by a small quantity of syrupy glucose, 2 fluidrachms of which will suffice for a pint of the syrup. In other respects the formula remains unaltered. The directions will then read as follows:

Dissolve the iodide of potassium [123 grains] in $\frac{1}{2}$ fl. oz. of water, and the tartaric acid [112 grains] in $\frac{1}{2}$ fl. oz. of diluted alcohol. Mix the two solutions in a vial, cork and shake well, and then place it in ice-water for half an hour; again shake thoroughly, and then pour the mixture upon a small white filter, and filter into a bottle containing 134 oz. of syrup, and $\frac{1}{2}$ fluid ounce of syrupy glucose. When the liquid has run through, wash the vial and filter with $\frac{1}{2}$ fluidounce of diluted alcohol, added in several portions. Then add enough syrup to make 16 fluidounces.

Demerara Pink Root.

THE directors of the Royal Gardens, Kew, recently received from St. Vincent, West Indies, specimens of a plant which was represented "to be poisonous to cattle, sheep, and goats, and to prove fatal in two or three hours." This plant was identified by Professor Oliver as *Spigelia anthelmia* L., a member of the natural order Loganiaceae, commonly distributed throughout the tropical parts of continental America and the West Indies. It is a glabrous annual, with two pairs of upper leaves so closely approximate that the plant somewhat resembles *Paris quadrifolia*. The flowers are small and tubular, of a white and pink color, arranged in a unilateral scorpioid raceme. The fruit when ripe is purple.

This species is figured in Browne's "Jamaica," t. 37, f. 3; in Tussac's "Flora Antillarum," IV., t. 8. and in Descourtilz' "Flore Médicale des Antilles," I., t. 61.

There is also a figure, a poor one, in the *Botanical Magazine*, t. 2,359. In the latter publication it is stated that "*Spigelia anthelmia* is a plant of considerable efficacy for the cure of worms and febrile diseases supposed to arise from the presence of worms. It was first brought into notice by Dr. Patrick Browne, in the "Natural History of Jamaica." . . . There can be no doubt, this and the allied *S. marilandica* are very efficacious remedies; but whether from the unpleasant narcotic effects which they sometimes produce, especially on the eyes, or some other cause, they seem now to be very much neglected." In Bentley and Trimen's "Med. Plants," 180, it is stated that "the root and herb generally of *Spigelia anthelmia* is a popular remedy in British Guiana as an anthelmintic. Its effect is said to be even more certain and marked than that of the official pink root (*S. marilandica*). Lunan in "Hortus Jamaicensis," p. 306, describes *Spigelia anthelmia* as "a powerful vermifuge which administered incautiously has proved fatal."—*Bull. of Kew Gard.*, 1888, 265.

Freckle Salve.—White precipitate, 5 parts; subnitrate of bismuth, 5 parts; glycerin ointment, 20 parts. Apply no oftener than once in three days, as it is apt to cause irritation if used oftener.

Pyrodine, a new Antipyretic.

If the chemical constitution of antifebrin and phenacetin be compared, it is easy to see the possibility of producing other substances and substitution-products likely to possess temperature-reducing properties. The present subject of examination and physiological experiment is a substance prepared by Ad. Liebmann and registered by Messrs. T. Levinstein & Co. as "Pyrodine," and which, as its active ingredients contains acetylphenyl-hydrazine— $C_{14}H_{11}N_3O$.

It is a white, tasteless substance, a crystalline powder, very sparingly soluble in cold water, possessing very little taste, and thus easily administered in powder form.

The results of the investigation are briefly summed up as follows:

- (1.) Pyrodine is a powerful antipyretic.
- (2.) It reduces fever temperature quickly, and maintains the temperature at a low level for some hours.
- (3.) It is easily taken, and produces marked perspiration, but not nausea, vomiting, or collapse.
- (4.) It is especially applicable in cases of pneumonia, scarlet fever, and typhus. Given in small doses in the latter disease, it enables the patient to pass through the fever at a low temperature range without delaying the crisis, and it seems also to shorten the period of convalescence.
- (5.) It is less applicable in cases of typhoid, owing to the early exhibition of toxic symptoms.
- (6.) It appears to act equally well in migraine and neuralgia, but observations are not extensive enough yet.
- (7.) Given in often repeated doses at short intervals it easily shows toxic properties, and these depend on the action of the blood, producing hæmoglobinæmia. It should not be given (unless the temperature be very high) oftener than once in 18 or 24 hours, and it is not safe to continue its use for more than a few days.
- (8.) It is found to act in cases where the other antipyretics have failed.
- (9.) The dose for children is 2-4 grains; for adults, 8-12 grains.
- (10.) It is much more antipyretic than either antipyrin, antifebrin, or phenacetin, but it is also much more toxic than these bodies.

This disadvantage is reduced by the fact that it is rarely necessary to give more than one dose in 12 to 18 hours, as the temperature is kept low for a longer period than if any of the other antipyretics are used.

(11.) It reduces the pulse as well as the temperature, and often causes diuresis.—J. DRESCHFELD.—(Abstract from *Med. Chron.*, 9, 89, in *J. Soc. Chem. Ind.*)

Adulteration of Ceresin.

CERESIN is a crude form of paraffin wax very much resembling beeswax in appearance, and sometimes employed as a substitute for that material. It is also largely used in conjunction with paraffin oil for the production of soft paraffin and, when of good quality, yields a preparation which as an elegant basis for ointments, where absorption by the skin is not required, compares favorably with any yet introduced.

In manufacturing "soft paraffin" artificially, one might imagine that the lower the melting point of the wax employed, the better would it combine with the oil, but in practice it is found preferable to use a wax of high melting point. A less quantity answers the purpose, and more perfect solution results. Hence a demand for a paraffin of high melting point exists. In examining a recent sample, by the methods described below, it was found to behave in such a peculiar manner that it was impossible to assign any definite temperature as the melting point. On heating a larger quantity, a distinct odor of resin was perceptible. It was further found that a sample heated in a water-oven for several hours and slowly cooled separated into two layers, one of which consisted the most part of rosin.

In order to estimate, approximately, the extent of the adulteration, a weighed quantity was boiled in a flask furnished with an upright condenser with about twenty times its weight of 95 per cent alcohol, being well agitated while the ceresin was fluid. The mixture was allowed to stand over night at normal temperature, and then cooled to zero for an hour. The separated paraffin was filtered off and washed with cold alcohol until the filtrate measured thirty times the weight of the original ceresin. It was then evaporated to dryness and weighed. The residue, which had all the characters of rosin, amounted to 53.6 per cent. To test the accuracy of the process, 5.12 grammes pure ceresin was mixed with 4.46 grammes rosin by melting them together, this yielding a mixture containing 46.6 per cent rosin. A portion weighing 1.880 grammes treated as above yielded 0.661 gramme alcoholic extract; deducting 0.010 gramme due to paraffin dissolved, as found by blank experiment, we have 47.2 per cent rosin indicated.

The following table gives general results:

	Sp. gr.	M. p.	Alcoholic extract.
Pure ceresin, No. 1.....	0.917	77° C.	0.8
Pure ceresin, No. 2.....	0.914	69° C.	1.4
Condemned ceresin.....	1.008	?	53.6
Mixture.....	0.982	?	47.9
Rosin.....	1.060	100° C.	100.0

W. H. SYMONS, in *Pharm. Journ.*

Alleged Existence of Morphine in Eschscholtzia.

BARDET and Adrian announce that the plant *Eschscholtzia californica* Cham. contains morphine, besides another alkaloid and a glucoside. Some of our contemporaries who have reported the above, do not seem to know that *Eschscholtzia* belongs to the natural order Papaveraceæ, and is closely related to *Papaver*. Hence the occurrence, therein, of a base, if not identical with, yet at all events analogous to morphine, is not so very surprising after all. But we need strong proofs to be convinced that the newly discovered alkaloid is really morphine. In 1844 Walz examined *Eschscholtzia*, and found in it three alkaloids, two of which (one bitter, the other acid) occurred both in the herb and the root, while the third, supposed to be identical with chelerythrine, occurred only in the root. It is known that there exists a close chemical relationship between the alkaloids of the poppy, those of *sanguinaria*, and *chelidonium*, though the exact position or correlation is not yet made out. And it is quite likely that the alkaloids of *Eschscholtzia* partake of this relationship.

Antiseptic Value of Various Compounds.

At a recent meeting of the Society of Chemical Industry, London, Mr. C. T. Kingzett read a paper on this subject. The author contended that all processes of fermentation were more or less similar in character, and that antiseptics behaved similarly toward all the organized ferments.

It is not sufficient to kill the organism present, but the antiseptic reagent, to be of any real value, must also be capable of oxidizing and destroying the active poisons or toxic principles which have been produced by the micro-organisms. Most of the chlorides, nitrates, and sulphates of the metals have been examined by the author, and he has tabulated the times at which putrefaction begins in solutions of beef extract to which known quantities of these various salts had been added. Copper and mercury salts were found to be most efficient in arresting decay. The change could be readily detected by the smell, and a color change from red to scarlet, due probably to aerobic micro-organisms, also marked the commencement of putrefaction. Various organic antiseptic reagents were tried, and the periods during which they were capable of staying putrefaction noted. The new antiseptic salufer (sodium fluosilicate) was compared in antiseptic value with "sanitas" and the bactericides. By far the most powerful of all antiseptics is, however, corrosive sublimate, but, unfortunately, this salt has no oxidizing properties, and therefore has no value for destroying the poisons produced in putrefaction. The properties of salufer appear to have been exaggerated. All acids are good antiseptics, and phenol, although limited in its uses, is to be recommended. The investigation has also shown that chloral has marked antiseptic properties, and that free boric acid is superior to borax and to the neutral borate. The bactericides are a class of antiseptics introduced by the author, which consist of any of the well-known and approved antiseptic agents, to which a five-volume solution of hydrogen peroxide has been added. The presence of this latter compound in the solution is of great value in supplying sufficient free oxygen to bring about destruction of the poisons produced in fermentation.

Manufacture of Hydrogen Peroxide on the large Scale.

SINCE hydrogen peroxide has become so important an agent for bleaching, oxidizing, disinfecting, and other similar purposes, the process formerly used has necessarily undergone material modification to make it serve the new conditions. At present the following process is employed on the large scale. Of course, the description refers only to one batch of materials from the beginning to the end. In large works, one batch follows another continuously, the several ones being only one step apart.

A copper boiler lined with lead is set into a wooden vat so that it may be surrounded by water. The bottom of the boiler rests upon a perforated false bottom, below which ends a pipe through which cold water may be admitted, an outlet being provided for at the side, and another at the highest point of the vat. The boiler is charged with 15 kilos of commercial hydrofluoric acid (which is made, on the large scale, on the premises), together with 80 kilos of water, and the dilute acid then exactly neutralized with barium peroxide (likewise made on the premises), previously ground to a smooth paste with about 20 liters of water. About 15 kilos of the peroxide will be required. The products are insoluble fluoride of barium and a solution of peroxide of hydrogen. During the reaction, the temperature of the contents of the boiler must be kept as low as possible by means of a bath of cold water. The paste of barium peroxide must be added in small quantities at a time, since each addition causes a rise of temperature. The contents of the boiler must be constantly stirred. About 12 hours are required for the reaction to be completed, which is indicated by litmus paper showing a violet-blue tint. The liquid represents about 100 liters of commercial peroxide of hydrogen of 10 to 12 volumes of oxygen. The residuary fluoride of barium is again employed in the manufacture of hydrofluoric acid, by decomposition with sulphuric acid.—After *Neueste Erfind. u. Erfahr.*

Nitrites of Ethyl and of Amyl.

I. On Nitrite of Ethyl.

PROFESSOR DUNSTAN, of the School of Pharmacy of the Pharmaceutical Society of Great Britain, has, for nearly a year, been engaged in the study of the pharmaceutical nitrites, and has, so far, obtained very interesting results which are likely to bring about considerable modifications, both in the quality of the products hereafter employed in medicine, and in their mode of preparation. His first paper, containing a report of his investigations on ethyl nitrite, made in conjunction with Mr. T. S. Dymond, appeared in the *Pharm. Journal* of April 14th, 1888. A second contribution on the subject of other nitrites has been made quite recently (*Pharm. Journal*, Dec. 22d), and as we are now enabled to present the subject in a more connected manner, we shall give an abstract of the essential parts of both papers here.

An impure solution of ethyl nitrite, of varying strength, has been used in medicine for a very long time, and of late years the conviction has gradually been gaining ground, that the medicinal activity of this solution, familiarly known as sweet spirits of nitre (*Spiritus Ætheris Nitrosus*) is mainly, if not entirely, due to the presence of ethyl nitrite. Among pharmacists this conclusion has long been apparent, and the introduction into medicine of a solution of pure ethyl nitrite has apparently been prevented only by the absence of a satisfactory, and at the same time sufficiently simple process for its preparation.

It is quite certain that all processes in which alcohol is made to react with nitric acid, with or without the presence of auxiliary agents, such as metallic copper and sulphuric acid, yield a product more or less contaminated with other substances, such as aldehyde, paraldehyde, and other oxidation products of alcohol.

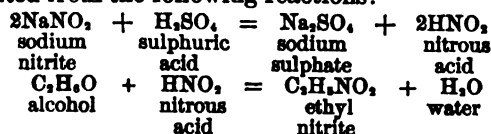
There are, however, two well-defined chemical reactions which lead to the formation of ethyl nitrite.

One consists in the interaction of ethyl iodide and silver nitrite. This produces insoluble silver iodide, and two metameric compounds, viz., ethyl nitrite (boiling at 17.5° C.) and nitroethane (boil. at 115° C.), which may be easily separated by distillation at a low temperature. Perfectly pure ethyl nitrite may be obtained in this manner.

The other reaction consists in allowing nitrous acid to interact with alcohol. "Nitrous fumes" are led into well-cooled alcohol, or the nitrous acid is generated from a dilute acid and a metallic nitrite in contact with alcohol.

Messrs. Dunstan & Dymond, recognizing the impracticability of using the first-named method, and not finding any of the published modifications of the second method entirely satisfactory,* determined to work out a process, if possible, in which all distillation was done away with. And this was finally accomplished in the following manner.

Dilute sulphuric acid is made to react with sodium nitrite and alcohol at a low temperature. The quantities are calculated from the following reactions:



A solution is made by dissolving 34.5 Gm. of sodium nitrite in water. The liquid is diluted to 120 C.c., and cooled below 0° C., by surrounding the vessel which contains it with a mixture of ice and salt. Sodium nitrite of commerce contains from 95 to 98 per cent of the pure nitrite, and therefore a quantity corresponding to 34.5 Gm. of the pure salt must be taken. A slight excess of the salt does not interfere with the reaction. (A method for assaying commercial nitrite of sodium will be found among the answers to queries in this number.) 13.5 C.c. of sulphuric acid are added to a cooled mixture of 32 C.c. of alcohol (Brit. Ph., sp. gr. 0.838) with an equal volume of water. The liquid is then diluted to 120 C.c., and cooled below 0° C. This acid liquid is allowed gradually to pass, through a thistle funnel, with constant stirring, to the bottom of the solution of sodium nitrite, contained in a long narrow glass vessel surrounded by ice and salt. The addition of the whole of the acid liquid occupies only a few minutes, and at its conclusion a pale yellow layer of ethyl nitrite is found to be completely separated from the lower layer of solution of sodium sulphate, which is semi-solid from the separation of crystals of the salt. Melting ice alone may be used for cooling the liquids, but in this case the acid liquid must be added very slowly, and much care is needed to prevent rise of temperature and evolution of nitrous fumes. The ethyl nitrite thus formed contains only traces of alcohol and water. The former is removed almost completely by agitation with cold water (in a separatory funnel), the latter by digestion with fragments of anhydrous (recently ignited) potassium carbonate.

From 30 to 35 Gm. of ethyl nitrite are obtained. The calculated yield is 37.5 Gm. There is little doubt that the ethyl nitrite thus obtained is almost, if not absolutely pure,

* The authors do not mention any of these modifications by name. We are, therefore, unable to say whether they have tried the process recommended by Prof. Emilen Painter in a paper read before the Am. Pharm. Assoc. in 1886 (see *Proceed.*, vol. 34, 61. In this process, nitrous acid vapors, produced by the reaction between nitric and arsenious acids, are passed into alcohol,

the only possible impurity being a minute trace of alcohol and water. The determination of its absolute purity is a matter of some difficulty, not only on account of the ease with which the substance may undergo decomposition during examination, but also because chemical analysis is powerless to deal with minute quantities of impurity, whilst the physical constants usually assigned to the liquids are to be regarded with suspicion, since it seems almost certain that they were obtained from impure material. It may be useful to mention now that the liquid boils at 17.5° C., and possesses at 0° C. a density of 0.917-0.920 (water at 0° = 1). The pure liquid is very volatile and unstable in presence of water or even of moisture. Its decomposition by water with evolution of nitric oxide is greatly accelerated by the presence of a minute quantity of acid, and in this respect resembles many other instances of hydrolysis. On this account the substance cannot be kept under ordinary circumstances without decomposition taking place. Access of moist air causes chemical change to commence, the liquid becomes slightly acid, and then decomposition rapidly ensues. But if the liquid is kept in contact with fragments of anhydrous potassium carbonate in a closely-stoppered bottle, it may be preserved for a long time without appreciable change. It may be useful to mention that potassium carbonate is the only substance which can be safely employed to dry ethyl nitrite. Calcium chloride slowly decomposes it, with formation of ethyl chloride, whilst phosphoric oxide, owing to its production of phosphoric acid, effects rapid decomposition.

The use of sodium nitrite, sulphuric acid, and alcohol has often before been proposed for making ethyl nitrite, but none of the processes were found suitable by the authors. By a careful study of the reaction under various conditions they have succeeded in devising a process which will enable any pharmacist to obtain without difficulty, and in a very short time, an almost theoretical yield of pure ethyl nitrite.

II.—On Nitrite of Amyl.*

The therapeutical value of amyl nitrite was inferred by Dr. Lauder Brunton from its known physiological action, and upon actual trial this was confirmed. But the amyl nitrite which was used for these experiments, as well as that which has been used since then, was always derived from rectified fusel oil, that is, the portion boiling between about 90° and 100° C., which somehow has been assumed to be pure amylic alcohol. Commercial fusel oil, however, contains a number of different constituents, chiefly the following:

Formula.	Boiling Point (centigrade).
Ethyl Alcohol, $\text{CH}_3\text{CH}_2\text{OH}$,	78.4°
Primary Propyl Alcohol, $\text{C}_3\text{H}_7\text{CH}_2\text{OH}$,	97.4°
Iso-butyl Alcohol, $\text{CH}(\text{CH}_3)_2\text{CH}_2\text{OH}$,	106.4°
α -amyl Alcohol, $\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{OH}$,	131°
β -amyl Alcohol, $\text{CH}(\text{C}_2\text{H}_5)\text{CH}_2\text{CH}_2\text{OH}$,	138°
Hexyl Alcohol (probably),	151°

When this is distilled, for the purpose of obtaining the amylic alcohol of commerce, the portion boiling between 127° and 133° C. is collected. Then it depends entirely upon the number of successive fractional distillations, and on the care bestowed upon these, what proportions of the original constituent the product contains. In fact, even rectified amyl alcohol is liable to contain a varying proportion of the above bodies, and for this reason "amyl nitrite" may contain the nitrites of three or four of them. Hence, before an examination of the constituents of "nitrite of amyl" can be undertaken, it is necessary to become familiar with the physical characters of the nitrites of the several constituents, chiefly iso-butyl and the two amyl nitrites. The preparation of these several nitrites, however, is a very difficult operation, owing to the fact that the alcohols must first be separated completely, which is impossible to be accomplished by fractional distillation. So far Prof. Dunstan has succeeded in preparing only the α -amyl alcohol in a pure state. The beta-alcohol is still under examination.

Iso-butyl nitrite was prepared by Prof. Dunstan in conjunction with E. J. Woolley, by a process analogous to that described under ethyl nitrite. It separates like the latter, is washed and dried in the same manner, and has the same proneness to decomposition. It boils at 67° C., and has a spec. grav. of 0.876 at 15° C. (water at 15° = 1). Prof. Cash examined this product therapeutically, and found it to bring about a rapid fall of blood-pressure, an acceleration of the pulse, and a powerful respiratory paralysis. In fact, iso-butyl nitrite was found to act more powerfully than the mixture which constitutes the commercial "amyl nitrite."

The liquid which has hitherto been known to scientific chemists as pure amyl nitrite is a mixture of the metameric nitrites of alpha and beta amyl, in varying proportion. In the original fusel oil, the proportion of alpha-amylic alcohol, which is optically inactive, is always greater than that of the beta-alcohol. Prof. Dunstan, in con-

* Abstract of a paper by Professor Wyndham R. Dunstan in the *Pharm. Journ.*, Dec. 22d, 1888.

junction with W. Lloyd Williams, undertook the tedious and difficult task to separate them. It being known that fractional distillation could not separate the amylic alcohols, and can only partially separate the isobutyl alcohol, the experimenters decided to convert that portion of fusel oil which boiled between 127° and 132° C. into alcohol-sulphates (sulphonates) of barium. About 300 Gm. of the before-mentioned fraction which had repeatedly been distilled between 127° and 132° C. were warmed for some days with an equal quantity of sulphuric acid. The liquid was then poured into 5 liters of water. The dark oily layer which separated was removed, and the clear liquid neutralized with barium carbonate. This solution of the barium salts of isobutyl-sulphuric acid, and the two amylic-sulphuric acids, was evaporated to about one-third of its original volume. The salts deposited on cooling the liquid were then many times recrystallized from water. By this means, the more soluble barium isobutyl-sulphate was removed, together with some of the beta-amylic-sulphate. From the mixed barium salts the alcohol was regenerated, by conversion into the sodium salts and distillation with diluted sulphuric acid. This regenerated alcohol was then converted into nitrite, consisting of course of the nitrites of both amylic alcohols in the proportion in which these were present. But while the alpha-amylic alcohol is optically inactive, and the beta-alcohol is laevorotatory, the nitrite was found to be dextrorotatory.

The process just described was then carried further so as to completely separate the two amylic alcohols. Omitting the details, it may be stated that the recrystallization of the barium salts was performed no less than *thirty-five* times, before the amount of the beta-amylic alcohol had been reduced to an almost inappreciable quantity. The final salt, representing almost pure alpha-amylic sulphate of barium, finally yielded an amylic alcohol which turned the plane of polarization only $\frac{1}{4}$ degree to the left, showing that it was not absolutely, but very nearly pure. The nitrite of this alpha-amylic alcohol is a pale yellow liquid having a not disagreeable odor, and producing when inhaled the characteristic nitrite effect. Experiments are at present under way to determine the relative efficacy of the several nitrites, with a view to decide as to which of them should either be used exclusively, or at least predominate in the medicinal article.

Phenacetin and Lactic Acid.

INCIDENTAL mention was made recently of the solubility of phenacetin in lactic acid at a temperature of 33° C., and of the suggestion of Messrs. Mirrachi and Raffi that its rapid absorption, when administered, notwithstanding its comparative insolubility, is due to the occurrence of lactic acid in the stomach. It is now further suggested (*Pharm. Zeit.*, Dec. 15th, p. 753) that the occasional failure of the compound to produce the expected relief from neuralgia or headache may be due to the absence of that acid from the stomach and the consequent imperfect absorption of the phenacetin, the inference being that the difficulty might be overcome by the addition of a little lactic acid.—*Pharm. Journ.*

Reactions of Phenacetin and Acetanilide.

A [HOT] aqueous solution of *phenacetin* acquires a violet tint when mixed with chlorine water. After a short time, the tint changes to ruby-red. The same coloration is produced by a solution of chlorinated lime.

On boiling a little acetanilide with a small quantity of alkaline solution of hypobromite of sodium, there is formed, in proportion to the quantity of acetanilide, a reddish-yellow turbidity or precipitate, and, at the same time, the odor of cyanide of methyl is noticeable. This reaction is common to all anilides, which are decomposed, when boiled with an excess of alkali, into salts and free aniline. The latter forms a red precipitate, in the cold as well as with heat, with sodium hypobromite.—*Arch. d. Pharm.*, Dec., 1888.

Preparation of Oxygen.

MR. GÖHRING calls attention to the advantages presented by hydrogen peroxide over potassium chlorate as a means for the preparation of small quantities of oxygen (*Chem. Zeit.*, Dec. 12th, p. 1,659). Commercial solutions usually contain about 3 per cent of the peroxide, together with some acid added for the sake of stability. Sufficient ammonia should be added, therefore, to render the liquid slightly alkaline, and then upon the addition of permanganate the oxygen is briskly evolved. A convenient apparatus consists of a flask fitted with a cork bearing a delivery tube, and a drop funnel. The flask is half filled with the solution; this is made alkaline, and after the cork has been fitted in, a small quantity of permanganate solution is run in through the drop-filter. The evolution commences at once and goes on regularly, and in this way 600 C.c. of 3 per cent solution can be made to yield a liter of oxygen, which, to be obtained chemically pure, needs only to be washed with sulphuric acid, and dried with calcium chloride. Should the evolution of gas stop prematurely, it will recommence upon the addition of a little more permanganate solution, and the exhaustion of the hydrogen peroxide is indicated when a small quantity of liquid, taken from the flask and acidulated with sulphuric acid, shows the man-ganic red color.—*Pharm. Journ.*

Use of Peroxide of Hydrogen in Analysis.

LEAD peroxide may be most readily dissolved by treatment with dilute nitric acid and a solution of hydrogen peroxide. Half of the oxygen from each of the two peroxides unite to produce an effervescence of oxygen, even when cold, resulting in the formation of a solution of lead nitrate.

A similar action of hydrogen peroxide I have frequently found of advantage in effecting the solution of a precipitate produced by ammonia and consisting mainly of ferric and aluminium hydrates, in which however, after washing, a little manganese is retained as Mn_2O_3 . The latter body will resist solution in dilute acid, and under these circumstances a drop or two of hydrogen peroxide will instantly clear up the solution.

In the same manner, ignited oxide of cerium, or oxide of manganese, may be readily dissolved by cold dilute acids mixed with hydrogen peroxide.—F. P. DUNNINGTON in *J. Anal. Chem.*

Detection of Aldehyde in Commercial Alcohol.

M. U. GAYON detects aldehyde in commercial alcohol in the following manner: Dissolve 1 Gm. of fuchsine in 1 liter of water. Add to it 20 C.c. of a solution of bisulphite of sodium, spec. gr. 1.261, which will gradually cause the color of the fuchsine solution to disappear. Next add 10 C.c. of pure concentrated hydrochloric acid, and keep the liquid in a well-stoppered bottle. Dilute the alcohol to be examined to a strength of 50 per cent, and mix 2 C.c. of it with 1 C.c. of the reagent; shake well and set it aside. If aldehyde is absent, the mixture remains colorless; but if it is present, a rose-red or violet color will appear, which tints, however, will only last a few minutes. According to Gayon, this test will reveal the presence of 1-500,000th part of aldehyde. By comparing samples of perfectly pure alcohol mixed with known percentages of aldehyde, an approximate estimation of the impurity may be made.—*Bull. Soc. Chim.*

Detection of Alcohol in Essential Oils.

DR. HERMANN HAGER has recently proposed a new method for detecting alcohol in essential oils, which depends upon the fact that glycerin has a strong affinity for alcohol and is even capable of withdrawing it from a mixture of essential oil and alcohol, provided due attention is paid to the strength of the glycerin and the proportions used.

This new glycerin method cannot, however, be used in the case of essential oils containing acid constituents, or such which are allied to these, because the layers do not separate in these cases with sufficient sharpness and transparency. Oils of this kind are those of bitter almond, cassia, cloves, etc. All thinly-fluid essential oils, however, after having been well shaken with glycerin, yield to the latter all the alcohol that may accompany them.

For executing this test, glass cylinders about 10 Cm. (4 inch.) long and about $\frac{1}{2}$ inch wide may be used. [Test-tubes of this size, provided with a foot of glass, are very convenient.] A layer of glycerin, about $\frac{1}{4}$ to $\frac{1}{2}$ inch high, is first poured into the tube, and the level of this marked on the outside, after the tube has stood at rest about ten minutes. Next, a layer of the ethereal oil, about $\frac{1}{4}$ to $\frac{1}{2}$ inch high, is poured on the top of the glycerin layer, and the level of the oil also marked with a line on the outside of the glass. [A narrow strip of paper may be pasted along the tube, upon which the marks may be made. If the tube is graduated, it will only be necessary to make a note of the mark at which the two layers stand.] Next, a stopper is inserted, and the tube well agitated for five minutes. It is then set aside to permit the layers to separate. If there is no clear separation after one hour, a short application of heat to about 122° F. is sufficient to bring this about. Since the essential oil may be removed, by means of pipette, from the surface of the glycerin, and put back into its original bottle, practically without loss, it is better to take longer cylinders, so as to make the columns of glycerin and essential oil five or ten times as high as those previously spoken of. If there is enough oil available, and this is done, the error in estimating the increase in the glycerin columns will be much reduced.

This method may be used also quantitatively. If the glycerin and oil have been successively weighed into the previously tared glass cylinder, and the oily layer (after shaking the rest) carefully removed, the remaining weight of the cylinder will indicate the loss of weight in the oil by withdrawal of alcohol, and the increase in weight of the glycerin by its absorption.

The glycerin to be used in this test must contain some water. It is most suitable when it has a spec. grav. of 1.225 to 1.230. A stronger glycerin would be liable to dissolve weighable quantities of the essential oil. It is best, if the glycerin layer is at least one-half times higher than the oily layer. In the case of those ethereal oils which are easily soluble in seventy-per-cent alcohol, it is even preferable to use a longer glycerin column, to prevent its eventual alcoholic percentage rising to near 70, which would cause a partial solution of the oils. Such oils are those of bitter almond, cajuput, geranium, hyssop, cherry, laurel, lavender, linaloe, cloves, organum, pimento, sweet orange, pennyroyal (*Pulegium*), rue, spike, thyme, etc.—Abstract from *Pharm. Zeit.*

Method for Determining the Cubic Contents of Vessels.—Sometimes it may happen that the cubic contents of an odd-shaped vessel—which it would be difficult to determine by calculation—are to be ascertained. This may be done, according to Perl and Kur, in the following manner. Fill the vessel full of water, then dissolve in this a *known* quantity of a substance which can be quickly and sharply assayed, for instance, sulphuric or hydrochloric acid. After this has been uniformly distributed and dissolved, remove an aliquot, but *known*, quantity, and determine the amount of the added substance. By a simple calculation, the total quantity of water, and, therefore, the cubic contents of the vessel, will be found.—*After Chem. Zeit.*, 1888, 1, 109.

Hayward's Hand-Grenades are charged with a solution containing calcium chloride, 18.4; magnesium chloride, 5.7; sodium chloride, 1.3; potassium bromide, 2.2; barium chloride, 0.3; and water, 72.2 parts. Whether the solution is made by dissolving the separate salts, procured as such, in water, or whether some liquid waste product of some chemical factory is made the basis of it, we are unable to say.

Powdered Camphor.—A correspondent of the *Journal de Pharmacie de Lorraine* writes that for some time past he prepares powdered camphor in the following manner:

Powder the camphor in the usual manner, with the addition of a little alcohol. When it has nearly been reduced to the proper degree of fineness, add a few drops of fluid petrolatum and immediately triturate again. In this manner a powder as fine as flour is obtained which does not cake together.

This powdered camphor may be used for all purposes, except for solution in alcohol, as it will impart to the latter a faint opalescence, owing to the insolubility of the petrolatum in the liquid.

Artificial Oil of Gaultheria.—Dr. E. Mylius reports that he has met with artificial oil of gaultheria—which is now made on the large scale from salicylic acid and methylic alcohol—which possessed a disagreeable, and in some cases "horrible" odor. He believes that all chemically prepared, odoriferous products are inferior in aroma to those produced by nature, though they may be chemically identical.—*After Pharm. Centralt.*

We have used considerable quantities of artificial oil of gaultheria, but have thus far not met with any to which the above criticism could be applied.—*Ed. AM. DRUGG.*

Quina Laroche Ferrugineux, a well-known French specialty, is said to be nothing more than a good bitter wine, containing 1 per cent of pyrophosphate of iron with ammonium citrate. Of course, the U. S. Ph. pyrophosphate of iron would answer equally well. The formula, as given by some of our exchanges, and adapted to practical working, would be about as follows:

Red Cinchona (Java).....	5 parts
Distilled Water.....	q. s.
Sherry Wine.....	100 parts
Diluted Alcohol (50%).....	50 "
Sugar.....	80 "
Pyrophosphate of Iron.....	8.8 "

Infuse the Cinchona with enough water to make 100 parts of infusion. In this dissolve the Pyrophosphate of Iron, then add the Sherry wine and diluted Alcohol. Mix well, allow to stand for some days, and filter.

Parthenicine is an alkaloid discovered by C. Ulrici, of Cuba, in a plant native there, *Parthenium hysterophorus*. It forms large rectangular prisms with pyramids on the four lateral sides. It is odorless, very bitter, readily soluble in water, and still more so in hot water, alcohol, ether, and chloroform. It gives color-reactions with sulphuric acid and potassium bichromate, which distinguish it. It has the power, administered in doses of 0.05 Gm. ($\frac{1}{4}$ grain), of assuaging neuralgia; it has also proved useful in intermittent fever.—*Merck's Bull.*

Narcosine as a Hypnotic.—*Pure narceine*, melting at 170° C. This is used, according to the clinical tests of Erlenmeyer and Reissner, as a valuable sedative and hypnotic in *psychiatric diseases*. The results obtained by it in this direction are superior to those obtained with morphine. In neuralgia and ischia it is preferable to morphine.—*J. Soc. Chem. Ind.*

Oxycyanide of Mercury.—The hydroxycyanide is described as destined entirely to supplant corrosive sublimate. In not attacking the metal of surgical instruments when used for disinfecting them, it is superior to that salt. In disinfecting bacterialized peptone fluids, it shows six times the bactericidal power of corrosive sublimate. The report of Stellden as to the successful use of the simple cyanide in diphtheritic cases has already been given.—*Merck's Bull.* in *J. Soc. Chem. Ind.*

Mercurio Cyanide.—Stellden reports on 1,400 cases of diphtheria treated by him with this cyanide. There were among that number only 69 deaths, these not amounting to quite 5%, whilst ordinarily in the same district the death-rate was 92%.

The mixture used by Stellden was honey, 450 grains; tincture of aconite, 30 grains; and mercury cyanide, 0.3 grain. A gargle of 1 part of mercury cyanide to 10,000 of peppermint water was also employed. The frequent doses and applications are said to create a medium in which the diphtherial bacillus cannot live.—*J. Soc. Chem. Ind.*

Artificial Coffee.—Artificial coffee beans are on the market. They consist of the roasted meal of various cereals massed with dextrin or some such substance. Two factories are said to exist in Cologne, which offer the machinery and plant with formulæ for £180. The apparatus turns out from 10 cwt. to 12 cwt. of coffee per day. The factitious "berry" can only be recognized with great difficulty. If the artificial coffee is mixed with genuine, its detection is believed to be almost impossible.—*Chem. and Drugg.*

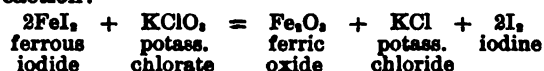
Note.—We have direct information from correspondents about the above. It is reported to us that the imitation of coffee beans is so perfect that even experts are deceived, without an analysis being made.—*Ed. AM. DRUGG.*

Linseed Oil is recommended by Prof. W. H. Thomson, of New York, as an expectorant. He thinks it more effectual than any other expectorant in rendering the bronchial secretion less albuminous and viscid, and in facilitating expectoration. It markedly diminishes bronchial irritation and is useful in asthmatic attacks affected by changes of weather. It is useless in capillary bronchitis, and of little value in broncho-pneumonia. Where the bronchitis is primary and local in origin, it is indicated. His formula for making an emulsion, in quantity, is:

Linseed Oil, 15 ounces; Oil of Wintergreen and Oil of Cinnamon, of each 2 drachms; Powdered Gum Arabic, 10 ounces; Water, 24 ounces; Glycerin, 5 ounces; Simple Syrup, 10 ounces; Dilute Hydrocyanic Acid, $\frac{1}{4}$ drachm. To be churned. Half an ounce constitutes a dose. To 6 ounces he might add 40 minims of Magendie's Solution and $\frac{1}{4}$ drachm of Chloral.—*Med. Record.*

The Solubility of Milk-Sugar.—G. B. Schmidt finds that a saturated aqueous solution of milk-sugar in water of 15° C. (59° F.) cannot be produced by agitation or trituration of the solid and liquid during a short time, as is the case with many other soluble solids. During the first half-hour, the solubility will be only 1 in 11.8; after four hours, it will be 1 in 8.6; after eight hours, 1 in 7.5; and after twenty-four hours, 1 in 6.3. The author recommends to use this length of time and water at 15° C. to prepare normal solution of milk-sugar, when no other directions are given. By continuing the maceration and shaking longer, the rate of solubility increases, so that after 12 days, it becomes 1 in 5. But for uniformity's sake, the author prefers 24 hours and 15° C.—*Maandblad voor Apoth.*, 1888, 167.

Incompatibility of Chlorate of Potassium and Ferrous Iodide.—Attention has recently been again drawn (in *Boll. farm.*) to the incompatibility of chlorate of potassium with preparations of ferrous iodide. Ferric oxide is gradually thrown down, and free iodine is liberated, according to the reaction:



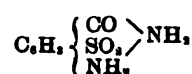
The addition of chlorate of potassium to syrup of iodide of iron, therefore, is to be avoided.

Preserving Aqueous Solutions of Citric or Tartaric Acids.—C. Reinhardt reports a method for preserving solutions of citric and tartaric acids, which is not at all new, but deserves to be recalled to memory, for the benefit of those who have to keep solutions on hand.

A 10-per-cent solution of either acid in water will keep for years without the formation of fungi, if about 4 grains of salicylic acid are added for each quart of solution. In the case of tartaric acid, even 2 grains will answer.—*Zeitsch. ang. Chem.*

Roaches, Bedbugs, and other insects may be kept out of rooms by making a decoction of 1 part of capsicum and 1 part of wormwood in 10 parts of water, and dissolving in every pint of the decoction 20 grains of extract of nuxvomica, 20 grains of extract of colocynth, and 20 grains of extract of aloes. This liquid is painted into all fissures or cracks in the walls and furniture. If the rooms are to be whitewashed, about 1 pint of the liquid may be mixed with a pailful of the whitewash.

A new Saccharin.—Another compound, closely allied to saccharin, having an intensely sweet taste, has been described by Dr. Noyes (*Amer. Chem. Journ.*, viii., 167). This compound is para-amidobenzolsulphinid, having the constitution that may be represented by the formula:



The compound may also be described as being a "saccharin" in which an atom of hydrogen is replaced by NH_2 . It is difficultly soluble in water, and a hot saturated solution shows a deep fluorescence.

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FREDERICK A. CASTLE, M.D.....EDITOR.

CHARLES RICE, Ph.D.....ASSOCIATE EDITOR.

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EDITORIAL.

THE Torrey Botanical Club, of this city, at a meeting held January 8th, authorized an appeal to the public in the interests of a botanical garden. The club, with justice, insists upon the importance of such an institution in connection with the colleges and schools of the city, and it is to be earnestly hoped that the effort may prove successful. In June and November, 1876, this journal urged the desirability of a well-equipped botanical garden for New York, and at that time the Editor had several interviews with prominent gentlemen in relation to a garden then proposed, but the project was never carried out.

There was a very creditable botanical garden in New York not many years since (as such matters go), but, strange as it may seem, Columbia College is to a great degree responsible for its destruction. As a bit of interesting local history, we take the following from *The American Medical and Philosophical Register* for July, 1811, which also contains a copper-plate engraving by Leney, showing the appearance of the garden at that time.

"This institution, the first of the kind established in the United States, is situated about three and a half miles from this city, on the middle road between Bloomingdale and Kingsbridge.* The ground, consisting of about twenty acres, was originally purchased of the corporation in this city, in 1801, by Dr. David Hosack, the founder of the establishment. The view from the most elevated part is variegated and extensive, and the soil itself of that diversified nature as to be particularly adapted to the cultivation of a great variety of vegetable productions.

"Immediately after the purchase, the proprietor, at a very considerable expense, had the grounds cleared and put in a state of cultivation, arranged in a manner the best adapted to the different kinds of vegetables, and planted agreeably to the most approved style of ornamental gardening. A conservatory for the preservation of the more hardy greenhouse plants was also built.

"As a primary object of attention in this establishment was to collect and cultivate the native plants of this country, especially such as possess medicinal properties, or are otherwise useful, among others, such gardeners as were practically acquainted with our indigenous productions, were employed to procure them, and by the distinguished liberality of several scientific gentlemen in this country, there were in cultivation at the commencement of 1805 nearly fifteen hundred species of American plants, besides a considerable number of rare and valuable exotics.

"In the year 1806 very important additions were made to the collection of plants, from various parts of Europe, as well as from the East and West Indies. A second building for their preservation was also erected, and the foundation of a third laid, which was completed in the following year. In the autumn of the same year, 1806, a catalogue of the plants, both native and exotic, which had been already collected, and which amounted to nearly two thousand, was published. Since that time the Botanic Garden has been greatly improved. The buildings, which are erected on the most recent plan adopted in institutions of this kind, consist of three large and well-constructed houses, exhibiting a front of one hundred and eighty feet. The greater part of the ground is brought in a state of the highest cultivation, and divided into various compartments, calculated for the instruction of the student of botany and medicine, and made subservient to agriculture and the arts. The whole establishment is surrounded by a belt of forest trees and shrubs, and these are again inclosed by a stone wall two and a half feet in thickness and seven feet high.

"As the expense requisite to effect these several purposes far exceeded the calculations the proprietor had originally formed, and being still desirous of perpetuating the institution, he was induced to offer the whole establishment for sale to the State at a fair and equitable valuation. An almost perfect unanimity of opinion prevailing among the gentlemen of the medical profession, relative to the advantages to be derived from an institution of the kind, as necessary to complete a system of medical instruction, and similar sentiments being entertained by many others who felt an interest in the literary reputation of the State, application was made to the legislature that permanent provision might be obtained by the purchase of the Botanic Garden by the State. On this occasion memorials from the State Medical Society, the Medical Society of the County of New York, and several other counties in the State, from the corporation of the city, the governors of New York Hospital, the students attending the medical schools, and from many of the most respectable inhabitants of the city, were presented. The legislature accordingly passed an act, during the session of 1810, for the purchase of the establishment,* and placed the same under the direction of the regents of the university. * * *

"Recently the institution has been committed to the superintendence of the College of Physicians and Surgeons of the city, to be by them kept in a state of preservation and in a condition fit for all medical purposes, and at all times open to the admission of such medical students as may resort thereto for the purpose of acquiring botanical science. It is confidently hoped that, as the improvements of this establishment for nearly ten years, while in the hands of a private individual, have far exceeded the expectations of the most sanguine, its future progress will be proportionably greater under its present governance."

Well, what has become of the "Elgin Botanical Garden" founded by Dr. Hosack, purchased by the State, and committed to the care of Columbia College? It was rooted up. Many of the plants were sent to the Bloomingdale Insane Asylum (a branch of the New York Hospital), where, we are informed, some are still to be seen, and Columbia College has leased the ground for building purposes. In 1835 these twenty acres were already valued at more than \$100,000. Who can estimate their value now, located, as they are, in the centre of the fashionable part, and of the wealthiest ward of the city? In the event of the establishment of another Botanical Garden here, the experience of the past should lead to some caution relative to the choice of the corporation which is to be its custodian, and Columbia College should at least purchase its site or contribute handsomely to its maintenance.

The petition of the Torrey Botanical Club mentions the desirability of securing a site in some of the proposed up-town parks, but it seems to us that the Museum of Natural History having already a magnificent park surrounding it, which, even allowing for future additions to the building, is amply sufficient for the purpose, is the proper body to maintain a botanical garden for the public benefit. One would suppose from the past history of this institution that stuffed monkeys, mummied remains of extinct Indian tribes, *et id genus omne*, were the only legitimate objects of its foundation, and that the vegetable kingdom could only become a proper subject for its attention when dead and vanished.

We have already referred to an attempt which was made in 1876 to establish another botanical garden, but which was never consummated. The history of this movement is rather interesting, and may bear narration in this

* [The present location of this plot is between Fifth and Sixth avenues, opposite to the Windsor Hotel.—Ed. AM. DRUGGIST.]

* [It was purchased for \$75,000 and subsequently ceded to Columbia College.—Ed. AMER. DRUGGIST.]

connection. About that time, the residents on Fifth Avenue in the neighborhood of the old Arsenal building attempted to secure the removal of the living animals accumulated there, and it was suggested that they be sent across the park to the Museum of Natural History, where they legitimately belonged. Thereupon, the owners of the real estate in the neighborhood, liking the howling of wolves at the moon and the screaming of the eagles no better than their friends on Fifth Avenue, went to the Legislature for a special charter empowering them to establish and maintain a botanical garden on the land surrounding the Museum of Natural History, excepting only so much as was actually occupied by the buildings belonging to the museum. It so happened that the removal of the animals from their present site was not achieved, and the danger being passed, the real-estate owners of the west side have not carried out their project of a botanical garden.

WE have already spoken of the new antipyretic pyro-din, recommended by Prof. Dreschfeld. It is, properly speaking, acetylphenylhydrazin, and has been, of course, at once declared to exceed all other antipyretics in efficacy. The depression of temperature caused by it lasts several hours, after which there is a light rise, followed spontaneously by another fall, so that the effect of one dose lasts a whole day. Fall of temperature is accompanied by perspiration; but no collapse or nausea is said to occur, even if the temperature falls 4° C. (7.2 degrees F.) [This latter statement has, however, been contradicted quite recently. Very serious effects have in some cases been produced by the exhibition of the remedy.] The dose for adults is 8 to 12 grains, for children 2 to 4 grains. Pyro-din is but little soluble in water, tasteless, and is best administered as powder, in capsules, or mixed with some wine or simple elixir.

CREOLIN, as a powerful antiseptic, has found further champions in the persons of Drs. Sirena and Alessi, who report that the addition of 8 to 10 drops of a three-per-cent aqueous solution of creolin to a pure culture, in beef-broth, of the comma-bacillus of Koch, is sufficient to completely sterilize the culture. They, therefore, suggest the therapeutic use of creolin in cholera, and believe that it will be found of great use in tuberculosis. Time will tell.

Meanwhile a wordy war is being waged between the rival manufacturers of creolin, which bids fair to throw some light upon the constitution, mode of manufacture, and probably also the merits of the rival products. A case has recently been reported by Dr. H. Rosin (in *Therap. Monatshefte*, 1888, No. 10) where a death ensued after the topical application of creolin solution to the vagina and uterus after delivery of a dead foetus. While the cause of death could not be positively ascribed to the creolin, the reporter nevertheless thought it proper to advise caution in the use of the new antiseptic until its properties and effects have been more fully studied. Some time ago, Gavalowski published the results of an analysis of creolin according to which this substance contains naphthalin, fluorescein, aniline, toluidine, sodium phenate, picric acid [?], resin (guaiacol) [?], fatty acids saponified by soda, benzol, parabenzol, toluol, xylol, and other coal-tar products. Artmann maintains that Pearson's creolin contains carbolic acid, while his own claims to be entirely free from this. We do not place very great confidence in the analysis outlined above, because we find that reputable chemists have failed to agree upon certain important constituents said to be present in, or absent from it.

PROF. EMLIN PAINTER, the chairman of the Committee on Arrangements for the next annual meeting of the American Pharmaceutical Association in San Francisco, informs us that the date of June 24th, 1889, has been definitely decided upon for the date of convening the meeting.

The committee is not yet prepared to make any further official announcement concerning the rates of other details connected with the trip. The outlook is favorable for a low round-trip rate, with stop-over privileges.

THE special attention of our readers is directed to a commentary on *Pepsin* contained in a paper, printed in this number, of Dr. Adolph Tscheppe, of New York, who has made the subject of pepsin and peptonization a special study for years, and who has already, on various occasions, made important contributions to our knowledge of the subject. The immediate cause of the publication of this commentary was the appearance of a criticism of the action of the National Formulary in not publishing a process for making pepsin. Dr. Tscheppe's paper will, it is hoped, show that the question was thoroughly discussed by the committee, and that their decision, to omit a process for the present, was perfectly justified under the circumstances. The time may come when it will be feasible to devise a process which can be practically followed on a small scale, and which will yield as powerful a digestive product as the best pepsin now in the market.

Densimetric Estimation of Albumin in Urine.

ALTHOUGH it has been shown that from the theoretical side there is much to be urged against the densimetric method of estimating the amount of dissolved matter in a solution, yet it is found in practice, in cases where accuracy to the first place of decimals is sufficient, that the method is extremely quick and handy. This is felt nowhere so much as in estimation of albumin in urine, and the following method is simple, and can be carried out clinically:

The filtered urine is mixed with just so much dilute acetic acid that, when it is boiled, all the albumin is coagulated; the right proportion may be ascertained with a small quantity of the urine in a test-tube beforehand. On being filtered from the coagulum, the filtrate should give no cloudiness with acetic acid and potassium ferrocyanide. A quantity of the urine is then placed in a flask, and the latter firmly closed with a clean caoutchouc stopper. The flask is hung for ten to fifteen minutes on a large bath, filled with water kept boiling. By this means the albumin is precipitated. It is then filtered off, the funnel leading through a cork with a hole in it into a flask, and being covered with a glass plate. The density of the urine* and of the filtrate is then estimated, not with a pycnometer (that is unnecessary for clinical work), but with an hydrometer marked to four places of decimals. Both fluids must be kept at the same temperature. This is best done by placing them in two cylinders, both immersed in a large vessel of water which should be kept at the same temperature if a series of observations are to be made. The temperature of 17.5° will be found most convenient. The difference between the two specific gravities is then multiplied by 400, and the product gives the number of grains of albumin in 100 C.c. of urine.

A large number of illustrative experiments are quoted in the original paper, in which the approximate accuracy of this simple process is demonstrated. The number 400 is the mean in round numbers of the factor $\frac{100 v_2}{v_2 - v_1}$.

The question naturally arises why a constant factor should give such good results in albuminous urine, when not only theoretically, but also in practice, it yields fallacious results in other albuminous fluids, such as the blood, transudations, white of egg, etc. The reason is that the factor must be multiplied by the difference in the specific gravities. In proteid solutions (other than albuminous urine) this difference varies from 0.0016 to 0.0128, whilst in albuminous urine this difference is much smaller, varying between 0.00012 and 0.0020, that is, in the former case, the difference is from six to thirteen times greater than in the latter, and therefore so many times greater will be the error introduced by the use of a constant factor. In the case of urine, this error may be neglected.—H. ZÄHNER in *Zeitsch. phys. Chem.* (*J. Chem. Soc.*)

Cotton-Seed Oil in Olive Oil and Lard.

A TEST for the presence of cotton-seed oil in olive oil has been published by Dr. Hirschsohn, which consists in well mixing 3 to 5 C.c. of the oil with 6 to 10 drops of a solution of crystallized gold chloride in 200 C.c. of chloroform, and placing the containing tube in a beaker full of boiling water for about twenty minutes. If the olive oil be pure, there will be no development of a rose color through the reduction of the gold salt (*Pharm. Zeit. f. Russl.*, Nov. 13th, p. 721). Dr. Biel proposes to apply this test also for the detection of cotton-seed oil in lard, using 5 or 6 drops of the gold solution to 5 grammes of the lard, and heating in a water-bath. At the end of twenty minutes, if the lard be pure, the mixture will be still colorless; but if cotton-seed oil be present, it will be of a rose to a red color, and greenish when seen by transmitted light (*Pharm. Zeit.*, Dec. 15th, p. 753).—*Pharm. Journ.*

* Or the density of the urine may be determined previous to coagulating the albumin. Care must be taken to note the exact temperature, so as to make the second determination at the same degree.—Ed. Am. Druggist.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,273.—Nickel for Culinary Utensils (Birmingham).

The question whether nickel is injurious to health when used as material or galvanic coating for culinary or table utensils has been repeatedly examined by sanitary experts, who are unanimous in their statement that this metal is absolutely harmless. One of the latest reports is that made by Laborde and Riche to the Académie de Médecine, in which the statements of the previous sanitary experts are confirmed.

No. 2,274.—Naphthalol (M. S. D.).

The name *naphthalol* is applied to a compound introduced about two years ago into medicine, which is analogous to *salol*, the salicylic ether of phenol, in this, that it is the salicylic ether of naphthol. It has the composition $C_{10}H_7O \cdot COOC_6H_5$. In its effects it resembles *salol*, being an active antifermentative and antiputrefactive, and therefore of great utility in diseases accompanied by either of these processes. But it has the advantage over *salol* that it is much less liable to produce dangerous or toxic secondary symptoms, no doubt due to the fact that when the compound is decomposed in its passage through the system, the liberated naphthol is much less energetic than phenol would be.

No. 2,275.—Pills of Permanganate of Potassium (Lawrence).

This subscriber wants to know which is the best excipient for pills containing permanganate of potassium.

A very good way is to use kaolin and petrolatum. For every 100 grains of permanganate of potassium, about 50 grains of kaolin is required. These are well triturated together, and the whole made into a mass with a sufficient quantity of petrolatum. It requires only a small quantity of the latter, only about 25 grains for every 100 grains of permanganate.

Prof. Patch, some years ago, advised also the use of resin cerate, of which 15 grains will be sufficient to make a mass with 100 grains of the salt.

No. 2,276.—Oleite, or Solvine (M. & P.).

The name *Oleite* has been given to the wonderful solvent first described in this Journal (*AMER. DRUGG.*, 1884, p. 22) under the name of *polyolve*. This compound, first prepared and studied by Dr. A. Mueller-Jacobs, is a liquid consisting of the ammonium, or potassium, or sodium salt of sulpho-ricinoleic acid, and possesses the most remarkable solvent properties. It will dissolve substances, and hold them in (practically) aqueous solution, which are soluble only in special menstrua. Though the value of the new solvent was at once recognized, various circumstances made a general application of it at that time impracticable. Since then, and particularly of late, more systematic efforts have been made to draw general attention to its great usefulness, and we have no doubt that it will soon be readily procurable in the market, and applied to a variety of purposes.

No. 2,277.—Crystallizing Hydrochlorate of Cocaine (A. S. T.).

This subscriber writes: "I have seen it stated frequently that the hydrochlorate of cocaine could be crystallized from alcohol. All of my efforts to obtain crystals of this salt have been unsuccessful. A hot solution, when allowed to cool, either forms a crust-like film upon the surface, or solidifies altogether, without forming any distinct crystals. And a cold saturated solution, when allowed to evaporate spontaneously, gives no better results. Does this salt require special manipulation to induce it to crystallize?"

As to alcoholic solutions of cocaine hydrochlorate, and the best method of causing the salt to crystallize therefrom, we have only a limited experience. In fact, we have never attempted to crystallize the salt from such a solution, but have accidentally obtained crystals when the solution had been set aside and allowed to evaporate spontaneously. The crystals were very small, but distinct. There being no object in keeping them, we used them up for other purposes.

Dr. Polenske, some years ago, reported (in *Pharm. Rundschau*) that the salt crystallized from a concentrated alcoholic solution, in hard, firm prisms, constituting a white, crystalline powder. It seems he never obtained any large crystals either, though he has worked with quantities on a manufacturing scale.

If one of our readers has had an experience in this matter, sufficient to point out a remedy for the alleged defect, it would be of more than individual interest.

No. 2,278.—Phenylhydrazin Test for Sugar in Urine.

This reaction was originally proposed by E. Fischer, and applied to urine by Prof. Jaksch. Though Fischer and Penzoldt subsequently declared it to be not absolutely reliable for this purpose, it has recently again been proposed by C. Schwarz, in a somewhat modified form, which is said to be free from liability to error.

The urine to be tested must first be rendered colorless. For this purpose, 10 C.c. of it are mixed with 1 or 2 C.c. of subacetate of lead solution, the mixture filtered, and 5 C.c. of the filtrate mixed with 5 C.c. of normal volumetric solution of potassa and 1 or 2 drops of phenylhydrazin. The whole is shaken up, and heated to brisk boiling. If sugar is present, the liquid assumes a lemon- to orange-yellow color, and, when it is supersaturated with acetic acid, a finely divided yellow precipitate separates which renders the liquid quite turbid and non-transparent. In absence of sugar, this precipitate never occurs in the case of urine.

No. 2,279.—Syrup of Yerba Santa.

One of our subscribers has favored us with a specimen of syrup of yerba santa made from the ground herb. This has been tested by us, as suggested by the sender, as a covering for the taste of quinine, and found to be quite efficacious. There is usually left a very slight bitter after-taste which can be removed by taking a peppermint lozenge into the mouth after the mixture.

Our correspondent may not be aware that the "National Formulary" contains both an Aromatic Syrup of Yerba Santa, made from the fluid extract, which latter is also made from the powdered herb; and besides, an Aromatic Elixir of Yerba Santa, both of which are excellent vehicles for quinine. The preparation forwarded by our correspondent is, no doubt, equally good, and upon further trial may possibly turn out to be even better. We would suggest that the formula be given to us for publication by the author.

No. 2,280.—Artificial Narceine (Washington).

We are unable to state whether the process patented in Germany to W. Roser, of Marburg (*Germ. Pat.* 44,890, Nov. 1st, 1887) is practically worked. On inquiry, we have found that the consumption of narceine has but slightly increased during the last year or so. Until there is more of a demand, it is not likely that it would pay to work the patent. We have looked up the latter, and will give an abstract of it here.

On dissolving methyl-narcotin chloride in water, and adding solution of soda, a precipitate is produced which is of a semi-solid consistence at ordinary temperature, and consists probably of methyl-narcotin hydroxide. This is gradually converted, on standing—quickly on heating—into narceine, according to the equation:



In place of the chloride, the bromide or iodide may be used.

No. 2,281.—Metabisulphite of Potassium (Supplement to our answer to Query 2,270 in our last issue).

Mr. Arthur Shearer (of the firm, A. Boake, Roberts & Co., London, has furnished the following information regarding metabisulphites to the *Chemist and Druggist*:

Sodium and potassium metabisulphites form solutions strongly acid to litmus. They differ from ordinary bisulphites in that they contain no hydrogen in their composition, e. g., $NaHSO_3$, ordinary bisulphite, $Na_2S_2O_5$, metabisulphite of sodium. They are far more stable than the bisulphites, not oxidizing nearly so readily upon exposure to air; they are also readily obtained, upon the large scale, in large, regular crystals, which fact is a guarantee of their purity and constant composition. The purity and the reliability of the salts are greatly in favor of their use in technical processes. The method given by some writers for preparing the compounds [viz., by supersaturating a strong solution of carbonate of potassium—some writers say a hot solution—with sulphurous-acid gas, and precipitating with alcohol] would not, in my opinion, yield meta compounds, but a mixture which is extremely unstable, consisting mostly of bisulphite of potassium, or of sodium, ($KHSO_3$; $NaHSO_3$), according to circumstances—indeed, it is hardly practicable to prepare the pure meta salts on a small scale. I may add that A. Boake, Roberts & Co. work patents for preparing both compounds, and are, I believe, the sole producers.

No. 2,282.—Easton's or Aitken's Syrup (W. S.).

So far as we know, the first publication of Easton's syrup was made by Dr. Aitken in his "Practice of Medicine." Dr. J. A. Easton was professor of materia medica at Glasgow, and died in 1865. The syrup, though credited to Dr. Easton, is often called after Dr. Aitken, which is sometimes misspelled Aiken. And Easton's name is some times misspelled Eaton, as for instance in the reprint of an article on this syrup in the *Amer. Journ. Pharm.*, 1867, 177, which contains the earliest mention of this preparation in this country. The original formula there given is as follows:

Sulphate of Iron.....	3	5
Phosphate of Sodium.....	3	1
Sulphate of Quinine.....	gr.	193
Dil. Sulphuric Acid.....	q. s.	
Water of Ammonia.....	q. s.	
Strychnine.....	gr.	6
Dil. Phosphoric Acid.....	16	
White Sugar.....	16	

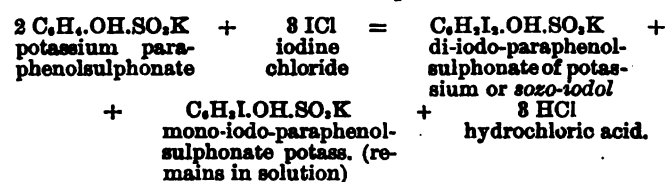
Dissolve the sulphate of iron in 1 oz. of boiling water, and the phosphate of sodium in 2 oz. of boiling water. Mix the solutions and wash the precipitated phosphate of iron till the washings are tasteless. With sufficient diluted sulphuric acid dissolve the sulphate of quinine in 2 oz. of water. Dissolve the phosphate of iron and the quinine thus obtained, as also the strychnine, in the diluted phosphoric acid; then add the sugar, dissolve and mix without heat. Each fluidrachm contains about 1 gr. of phosphate of iron, 1 gr. of phosphate of quinine, and $\frac{1}{2}$ gr. of phosphate of strychnine.

As the Brit. Pharm. was not then in existence, the diluted phosphoric acid meant is no doubt that of the London Pharmacopoeia (neither the Dublin nor the Edinburgh Pharm. containing it). This acid is the tribasic or orthophosphoric, being directed to be made from phosphorus with the aid of nitric acid.

No. 2,283.—Sosoiodol (A. W.).

Sozoiodol has been for some time on the market. It is recommended as a substitute for iodoform, and has been favorable reported upon by various authorities, but it is too soon to pronounce definitely on its merits.

Sozo-iodol (in German: *Sozoiodol*, the *j* pronounced like *y*) is a name given, for convenience's sake, to the sodium, or potassium salt of di-iodo-paraphenol-sulphonic acid. If phenol is brought in contact with strong sulphuric acid, two isomeric sulphonic acids are formed, namely, the ortho- and the para-phenol-sulphonic acid. If the reaction takes place with the aid of heat, the product consists mostly or entirely of the para-acid. In the free and pure state the acids are not known. When present together, they may be separated by combining them with potassa, the potassium salt of the para-acid crystallizing out first. On treating the paraphenolsulphonate of potassium with iodine in presence of oxidizing agents, iodine enters into combination, and the acid salts of the iodized phenolsulphonates separate out in form of a crystalline precipitate. As oxidizing agents, various substances or methods may be employed. In the following scheme chloride of iodine is used as example:



The process and the products are protected by a patent issued to H. Trommsdorff in Erfurt. The products obtained by the above process may be used as starting points for coloring agents.

No. 2,284.—Rat-Poison (M. L.).

The number of proposed rat-poisons is legion. We have most confidence in phosphorus paste and in ground flaxseed mixed with plaster of Paris. It hardly pays any one to make phosphorus paste himself, unless he wants to make it for sale, or unless he needs a considerable quantity of it. We will, however, give a formula:

Phosphorus Paste.

Phosphorus	45 grains.
Water	1 fl. oz.
Sugar.....	$\frac{1}{2}$ oz.
Rye Flour.....	q. s.

Introduce the phosphorus into a bottle containing the water, place it on a water-bath until the phosphorus melts, then cork and remove the flask, and shake it briskly and continuously until it is merely warm, so that the phosphorus may be finely divided. Next add the whole contents of the flask out-doors to a mixture of 1 oz. of rye flour and the sugar, and incorporate it thoroughly. According as it may be desired more or less plastic, the quantity of rye flour may be increased or diminished.

This paste should be used while fresh.

The mixture of ground flaxseed and plaster of Paris is best made with the intervention of butter, previously browned in a pan over the fire.

A good rat-poison is also the following, after Dieterich:

Gliricin.

Wheat Flour.....	50 parts.
Fresh Milk.....	100 "
Mutton Tallow.....	10 "
Chloride of Sodium.....	1 part.
Squill, in coarse powder.....	40 parts.

Mix the wheat flour and milk, then add the tallow and salt, and heat for twenty minutes over a steam-bath. Lastly, incorporate the squill.

Another compound has recently been proposed by Ed. Ritsert (in *Neueste Erfind. und Erfahr.*):

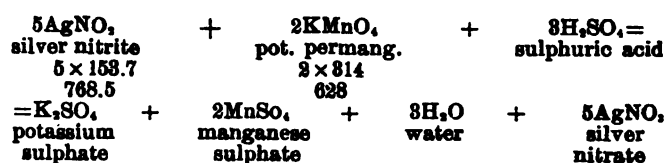
Wheat (whole)	2 lbs.
Nitrate of Strychnine.....	.45 grains.
Fuchsine.....	q. s.
Saccharin.....	.15 grains.
Water	q. s.

Dissolve the nitrate [or any other salt] of strychnine in a pint of water which has been colored with a sufficient quantity [about 4 grains] of fuchsine. Introduce the wheat into this liquid and macerate it for one or two days, until the wheat has soaked up all the liquid. Then drain the wheat, dry it partly, and impregnate it with a solution of the saccharin in about 4 oz. of water, prepared with the aid of a little bicarbonate of sodium [or with a mixture of $\frac{1}{2}$ fl. oz. of *Liquor Saccharini* (Nat. Form.) and $\frac{3}{4}$ fl. oz. of water].

No. 2,285.—Assay of Commercial Nitrites of Sodium or Potassium (E. J. S.).

This is most conveniently done by means of volumetric solution of permanganate of potassium of known strength. A decinormal solution would have to contain 3.14 Gm. of the pure salt in 1 liter. But as it is practically impossible to insure the stability of such a solution for a long time (though it may be kept for months if care is taken), it is best to ascertain the titer of the solution by a blank experiment with oxalic acid or ammonio-ferrous sulphate previous to its use in the intended assay. Supposing the solution were exactly of the strength above mentioned, then 50 C.c. would be the exact amount required to completely oxidize the oxalic acid contained in 50 C.c. of a solution containing 3.15 Gm. of the latter in a liter. In reality, however, it may require either more or less of 50 C.c. of permanganate, but the analytical value may be easily determined by a simple calculation.

In the case of nitrites, it is best to ascertain the titer of the permanganate solution by a preliminary experiment with a highly dilute solution of nitrite of silver. The reaction between silver (or any other) nitrite and permanganate takes place in the following manner:



Dissolve 0.1537 Gm. of pure silver nitrite in 200 C.c. of pure water, previously ascertained to be inactive towards permanganate. Each C.c. of this solution will contain 0.000384525 Gm. of silver nitrite, and correspond to 0.000175 of nitrous acid (HNO_2), etc. Transfer 20 C.c. of this solution to a beaker, add a few drops of diluted sulphuric acid, and next allow a little of the permanganate solution to drop in from a burette until the liquid in the beaker becomes faintly turbid. Again slightly acidulate with sulphuric acid (to dissolve the suspended manganic hydrate) and continue the alternate addition of acid and permanganate until finally the red tint of the latter persists. Towards the end, the addition of acid need not be made with such care. The reason why the acidulation must be made in small instalments is this, that a larger quantity of sulphuric acid, added at once, would cause the escape of nitrous fumes before the permanganate would have a chance to reach it. The number of C.c. of permanganate used will furnish, by calculation, the relationship, in oxidizing power, or in equivalent strength, of this solution towards nitrous acid.

Having thus ascertained the titer of the solution, we can proceed to assay nitrite of sodium, for instance. Of course, it is assumed that this salt contains no other constituent capable of reacting with permanganate. As prepared on the large scale, the commercial salt (purified by alcohol) contains from 94 to 98 (or more) per cent of pure nitrite, some nitrate, also caustic alkali, and often some acetate (due to oxidation of alcohol used in purifying it). Organic oxidizable substances are probably always absent. The assay is made as follows: Dissolve 1.725 Gm. of nitrite of sodium in pure water to 1 liter, transfer 50 C.c. of this to a beaker, and titrate with the permanganate solution in the same manner as directed in the case of silver nitrite. From the number of C.c. consumed, calculate the results. If the permanganate solution was exactly of the first mentioned decinormal strength, then the number of C.c. of it consumed, multiplied by 2, will indicate the percentage of pure nitrite in the salt.

Constituents of Strophanthus.—Steinach announces that he has found strophanthus to contain probably another principle (besides strophanthin) which has the property of producing in animals a complete and long-enduring anaesthesia of the cornea and conjunctiva, without affecting the pupil of the eye, and without rendering the cornea opaque.

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Whole No. 177.

[ORIGINAL COMMUNICATION]

THE PROPOSED BOTANIC GARDEN.

READERS of the AMERICAN DRUGGIST, who are interested in the proposed plan of establishing a botanical garden in this city, may like to know something of one of the sites which has been mentioned as particularly eligible for this purpose.

Those who have travelled on the N. Y. and Harlem R. R. will recall the Bronx River, which is nearly parallel with the course of the railroad for many miles beyond Fordham, and which, at this place, passes off towards the south, to empty into the Long Island Sound beyond Riker's Island. From its mouth to a point near Woodlawn Cemetery, this stream forms the boundary of the city, and throughout a greater portion of its course its surroundings are of the most picturesque character. In

[ORIGINAL COMMUNICATION.]

THE OLD LONDON DRUG WAREHOUSE.*

IF the proposed demolition of the old warehouses in Fenchurch Street, belonging to the now defunct East and West India Dock Co., becomes *un fait accompli*, the London drug trade will lose one of its most interesting landmarks.

In these warehouses are situated the rooms in which for years past the members of the trade have been accustomed to inspect the drugs offered for sale by auction every fortnight, and it is not saying too much when we state that generations of druggists have trod the floors of these rooms since they were first devoted to their present use. Whilst some have come for profit, others, like the late Daniel Hanbury, have come for instruction, and to these latter the room and its contents must ever have proved a source of invaluable information.



A view in the Bronx Park.

1883, the Legislature of the State appointed a commission to select and locate lands for public parks, and this commission chose, among others, an area of about 660 acres, located on both sides of the Bronx, from Williams Bridge on the North to West Farms on the South, the centre of which is to the eastward of the St. John's College, at Fordham. The late Professor Alphonso Wood, of the College of Pharmacy of the City of New York, used to be enthusiastic over this bit of country as a field for botanical research, and was accustomed, every spring, to take his class to it as a most desirable place for field practice. Taking a train on the Harlem R. R., from the Grand Central Depot to the Jerome Park Station, a short walk to the eastward brings the visitor to the western bank of the Bronx, and discloses one of the most charming bits of landscape to be found anywhere in the neighborhood of the city. We give a single illustration of a portion of this tract, but the number of equally beautiful views are almost without limit. Wherever in this park the botanical garden may be located, it will have most delightful surroundings; the only disadvantage being, that for many years to come it will be beyond the reach of the majority of those who might profit by its existence. For the present generation, at least, the park surrounding the Museum of Natural History would seem to be a better location, since it would be much more accessible for students and casual visitors.

Here may be seen collected together drugs from almost every country in the world—drugs, not as seen in the chemist's store, but in the natural condition in which they are sent from the various points of production. In the small museum attached may be seen specimens of everything in the way of curiosities that have appeared amongst the drugs imported during the last thirty years; fine specimens of gums of all descriptions; roots which have by nature been twisted in life-like and grotesque shapes; curious insects imbedded in transparent gums; skeletons of rats and reptiles, which have from time to time been found amongst the various goods sent into the port of London.

In the various show-rooms may be seen once every fortnight the goods which are offered for sale on the following day, and a casual visitor will find plenty to instruct him if he chooses to turn in and inspect them. To such as are not in a position to do so, a brief description of the various articles may not be devoid of interest.

The bulky goods are those which first attract the attention. Rows of serons of ipecacuanha meet the eye. These serons are made of hides, in pieces laced together with leather thongs. Sometimes as many as a hundred are exposed to view, but for the last year there has been a great scarcity of this root, and there are seldom more than

* From our English Correspondent.

about thirty to be seen at one time. Lately attempts have been made to introduce ipecacuanha grown in the East Indies, but the attempt has not been successful, owing to its inferior quality, and the few bales that have been disposed of have realized such low prices that there is not much chance of the attempt being made again. The East Indian root is in thick, short pieces, somewhat similar to the Carthaginian species, but paler in color, and is said to be totally deficient in the properties which render the South American root of value. The various descriptions of sarsaparilla are always plentifully exhibited, and the visitor may be sure of seeing nearly every kind. The Jamaican is the most valuable, and comes in large bales made up of small, roughly done-up bundles. There is also what is called "native Jamaica," which is easily distinguished from the real Jamaica by its red color, and seldom or never coming in bundles, being generally packed loose in bales. The Honduras kind is always done up in neat, tightly bound bundles, or bobbins, and is generally covered at each end with hides in addition to being iron hooped. Other inferior kinds are the Guatemala, Guayaquil, Lima, Jamaica, and Mexican, the latter being generally of very indifferent quality. Aloes of all sorts take up a considerable share of the room, and display infinite variety in the mode of packing. East India socotrine aloes are almost always in kegs; Zanzibars are either in tin-lined cases or else are packed in the skins of monkeys. The cases generally fetch more money, and therefore it is sometimes the practice to run those in skins into cases and resell them. Curaçoes are sometimes in boxes, but as often in gourds, and the different qualities of these are almost endless, the low dark predominating and the fine bright livery being scarce. Gum Benjamin is another article of which plenty can be seen by the visitor. The Siam quality is the most esteemed, and when in bold, flat pieces commands a high price. Of this gum a very fine specimen may be seen in the museum referred to, being a piece of the identical gum which was used at the funeral obsequies of the Emperor Nicholas, of Russia, and which then realized £120 per cwt. Sumatra and Penang kinds are of about equal value, and are of nearly similar quality, the Penang having a more glassy appearance than the Sumatra. This gum is always packed in large, square blocks, which have to be cut open before the quality can be discerned. In former days, it was the practice to saw the blocks in halves across the middle, but the shippers of the gum acquired a knowledge of this practice, and utilized it by packing the ends with gum of inferior quality, so that now it has become necessary to cut one or two blocks diagonally in order to discover the deception, and it is needless to say that this has been of great effect in preventing the fraudulent practice which we have mentioned.

We have not space here to give details of all the goods which may be seen in these warehouses, but they comprise a host of drugs, among which may be mentioned gamboge, myrrh, dragon's blood, gums of all sorts, jalap, sarsaparilla, rhubarb, scammony, and other drugs too numerous to mention. The valuable goods, such as musk, ambergris, civet, castor, etc., are shown in a separate room, and are equally open to inspection by the public. On a long table, running down the centre of the room, are laid out the various tins and bottles of these goods. A custodian is appointed by the Dock Company to watch the valuables and pilot the visitor on his voyage through the room. Most of my readers will be familiar with the appearance of musk in the pod, but, perhaps, some of them have only seen what are now called the old-fashioned pods, that is to say, the pods which have a thick under and upper skin. The attention of these must be called to what are called the thin-skin pods. These pods have the usual thick skin underneath, but the upper skin is simply a thin bladder, generally of a blue tint, the slightest prick in which would be sufficient to release the treasure confined beneath. These pods at the present moment realize about 95s. per oz., whereas the old-fashioned pods fetch about 10s. under that figure. The musk offered for sale is all of it sorted over by the warehouse keeper, and classified either as pile 1, 2, or 3, according to quality, the worst pods being of course put in the third category. False packing is of frequent occurrence with musk; John Chinaman being by no means above inserting lumps of lead and other foreign substances into the pods, and it is marvellous how cleverly they sometimes adulterate a pod which, to all external appearance, has never been tampered with. Russian cabardine pods have been greatly improved in appearance during the last few years, some fine parcels of thin-skinned pods having been on the market recently. Ambergris is also shown in all qualities, from fine light and gray down to black substances, which cause wonder as to what purpose they can be applied to.

Want of space compels me to forego a more full description of the articles of interest to druggists that can be seen at the Fenchurch Street warehouse, but I can only invite the visitor to London to include the "drug show room" in the programme of his tour, and can safely promise that he will derive both amusement and instruction from the experiment.

Creosote is said to be rendered tasteless by administering it in brandy and carbonated water.

[ORIGINAL COMMUNICATION.]

PHARMACOGNOSTICAL NOTES.

No. 6.—INSECT FLOWERS.

BY JOS. SCHRENK.

THE contradictory and, in many respects, incomplete descriptions of the anatomical characteristics of the flowers furnishing insect powder, contained in recent publications,* was noticed when I had occasion to refer to them during an examination of some samples of the powder. In this brief note I will discuss only those points which seem to have been overlooked by former observers.

The ridges on the stems of the flower-heads of *Chrysanthemum cinerariæfolium* Benth. and Hook. (furnishing the Dalmatian flowers) consist of collenchyma tissue, which surpasses in bulk the bast and woody tissues of the fibro-vascular bundles; we find, therefore, in the powder fragments composed of collenchyma cells. It is evident that their number must vary in proportion with the quantity of stems ground with the flowers; in a good powder they should be met with only sparingly, but as their thickened walls consist of cellulose, they can be easily detected by the use of Schulze's reagent (chloriodide of zinc). In *Chrysanthemum roseum* Weber & Mohr (the principal species furnishing the Persian insect powder), even the depressions between the ridges are lined with a layer of these cells, so that a closed ring of collenchyma is seen at the circumference of the cross-section of the stem.

The scales of the involucre are always strengthened and stiffened on their outer side, over and on both sides of the midrib, by a coherent layer of sclerenchyma cells, many of which are elongated, with oblique, often even pointed ends, and joined in the manner of prosenchyma cells. In the smallest quantity of the powder we find some fragments entirely consisting of these sclerotic cells, which are recognized as such by their thick walls pierced with narrow canals. These fragments are much more numerous in the Persian than in the Dalmatian powder; this is readily accounted for by the fact that the greater portion of the very rigid, greenish involucreal scales (with the exception of the dark reddish-brown scarious margin) consists of sclerenchyma cells.

On the outer surface, and along the membranaceous edges of the scales of the Dalmatian flowers, there are numerous hairs of a very characteristic structure. A long cell with attenuated ends is placed horizontally on a stalk formed of from one to three cells arising from the epidermis. Usually the terminal, horizontal cell is bent and twisted in various ways (Figs. 1 and 6), frequently hooked at the end (Figs. 3 and 4), so that a dense, felt-like layer is formed, especially on the outermost scales. The point of insertion of the stem of the trichome also varies; frequently it is shifted to near the extremity of the terminal cell (Fig. 6), which is particularly the case with the hairs at the margin, near the apex of the scales. The flower stems are also densely covered with hairs of the same kind.

Unger† noticed similar trichomes on the stem of *C. roseum* cultivated near Berlin, and calls them "glandular hairs (colleters)." If they are of the same nature as those observed by myself, as I must assume from Unger's description and figure, they cannot be glandular hairs or colleters. Neither their contents nor the shape and structure of their walls compel us, in the absence of any observed secretion, to assign to them the function of glands, especially as the flowers of our plant are abundantly supplied with another kind of trichomes which are unmistakable epidermal oil-glands.‡

Unger states expressly § that *C. (Pyrethrum) cinerariæfolium* is *glabrous*. Numerous samples of the best quality of Dalmatian flowers, both closed and open, obtained from reliable commercial sources, invariably exhibited the hairs described.¶ It is barely possible that Unger has in view the flowers of *C. cinerariæfolium* growing spontaneously, which I had no opportunity to examine. If so, the general statement that the flowers are glabrous is, to say the least, misleading, for all the commercial Dalmatian insect flowers are obtained from cultivated plants. In any case, I must consider the occurrence of these characteristic hairs of great diagnostic importance, for, as the scales form a considerable portion of the flowers, the hairs always ought to be seen in the powder. In fact, I never

* An article by J. Hart (British and Colonial Druggist, reprinted in Pharmaceutical Record, Oct., 1886) is accompanied by some drawings which are intended to illustrate the tissues met with in the different parts of the flower. They are, however, so indistinct and devoid of minuteness of detail, that they are of little practical use. The elaborate paper by H. Unger in Pharmaceutische Zeitung, vol. xxxii., p. 685, and vol. xxxiii., p. 81 and p. 181, contains, besides the literature of the subject, valuable information, chiefly in reference to the amount and composition of the ash of various samples of the powder. There is also found a good morphological description of the flowers, while the histological characteristics are not completely stated.

† In an article by G. M. Beringer on the "Hungarian Daisy" (Amer. Journal of Pharm., 1886, No. 1), which came to my notice after these notes had been written, the anatomical structure does not receive any attention. The only allusion to a microscopical examination is found on p. 4: "Microscopically no difference could be detected between the two powders," i. e., those of the "Daisy" and the insect flowers. (1)

‡ L. C.
§ C. F. Flückiger, "Pharmakogn. d. Pflanzenreiches," p. 788: "sessile, four-celled glands."
¶ L. C., p. 81.

Neither Flückiger or Marmé in their works on Pharmacognosy mention the hairiness of the scales.

failed to find them in good Dalmatian powder, at least the large terminal cells, either entire or broken.

In Persian insect powder I could detect only very few hairs, and the flowers of *C. roseum* which I subsequently examined proved to be almost entirely glabrous, only at the region where the stem widens into the receptacle, was the surface of the stem as well as the base of the outermost scales found covered with a white hoariness. The hairs were of the same structure as those described above, but the terminal cells were much longer. Very rarely a few scattered, very long hairs were found along the midrib, near the apex of the scale. The flowers examined had been imported from Batum, and answered in every respect the description of *C. roseum*,* so that Unger's assumption (based on the examination of some specimens raised in the botanic garden at Würzburg), that the spontaneously growing plants of *C. roseum* have no hairs at all,† does not seem to be correct, and it will be hardly necessary to consider the hairs found on the stems of the plants cultivated in the vicinity of Berlin as a specific distinction.‡ Still, the scarcity of these trichomes on *C. roseum*—provided it proves to be constant—combined with the comparative abundance of the sclerenchyma cells mentioned above, would enable us to tell the powders obtained of the two species of *Chrysanthemum* from one another.

These hairs are entirely absent from the involucre and the stem of a spurious insect flower known to the trade as the "Hungarian" or "Russian daisy," which seems to have been used as an adulterant of the Dalmatian flowers for some time.§ The admixture of this article to the true flowers, could, therefore, eventually be detected by the scarcity of the hairs; by a careful comparison with a standard powder even the relative proportions might be approximately computed. As a positive characteristic I would mention the small several-celled hairs which I detected on the apparently glabrous scales of these spurious insect flowers in considerable numbers. At first all of them presented themselves as simple, straight, four to ten celled trichomes (Fig. 11), but the peculiar abruptness of the terminal cell caused me to inspect a large number of hairs, when I noticed some which showed at their end the remnants of what must evidently have been a large inflated cell (Fig. 12). At last I detected a few hairs with a much elongated and thin-walled end-cell (Fig. 13). There seems to be little doubt that these are glandular hairs. The inflation and rupture of the terminal cell is a striking peculiarity of histological interest and deserves closer investigation. Another form of glandular trichome, consisting of 10 or 12 cells which form a globular head supported on a short stalk, occurs on the scales of these flower-heads.

Most conspicuous among the fragments of the marginal corolla in insect powder are the papillæ covering the upper epidermis (Fig. 10). Their much-thickened striate walls do not seem to be easily broken up during the process of grinding. But as the petals of other related species are similarly constructed, this is of little practical importance. Merely for the sake of placing the observation on record, I mention the occurrence of stomata on the marginal corolla of *C. cinerariæfolium*, which are remarkably numerous, especially on the lower side.¶

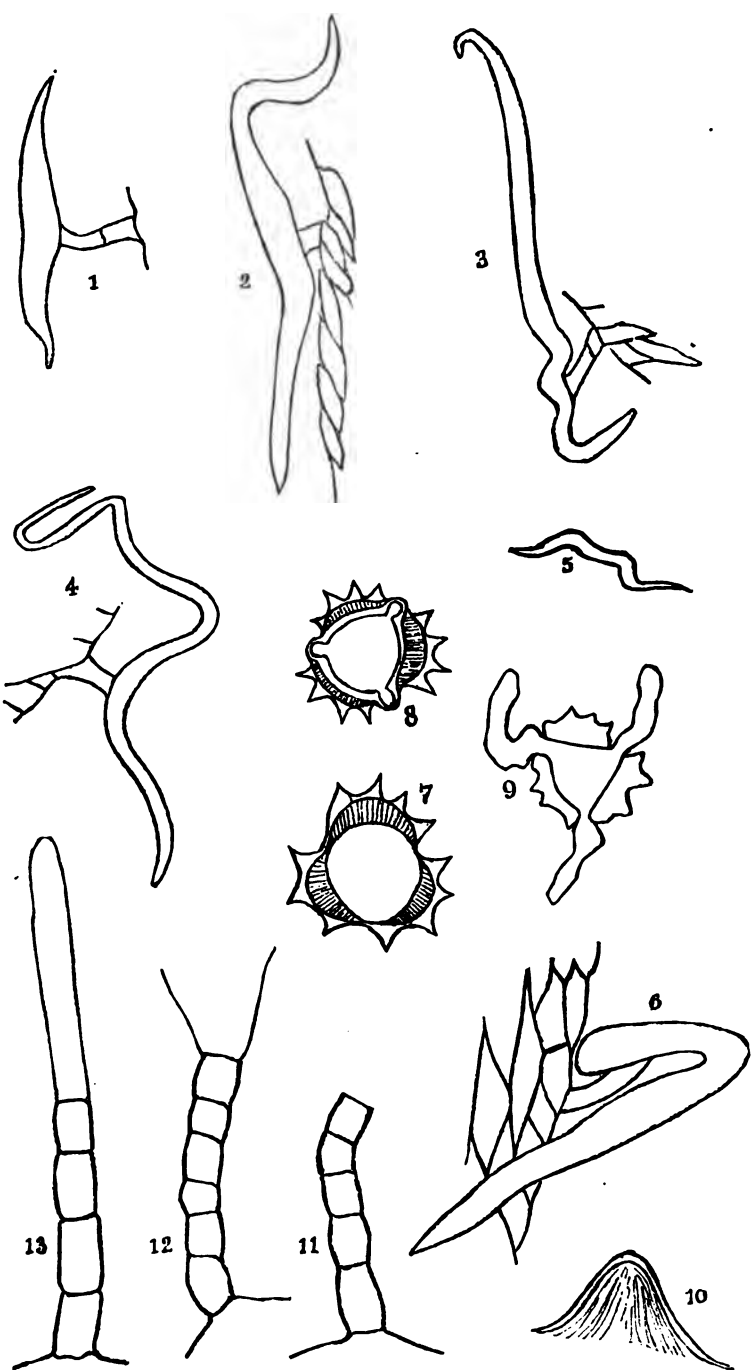
The pollen grains are not perfectly globular, as might be inferred from some descriptions and figures, but on an optical cross-section present the appearance illustrated by Fig. 7, which shows the three depressions in the very much thickened, prickly exine, at which the intine breaks through when the pollen-sacks are formed (Figs. 8 and 9). The spurious insect flowers mentioned above have pollen grains of very similar structure and size, so that the comparatively large amount of pollen in a powder is not *eo ipso* a proof of its genuineness.

The insect flowers raised in California (Buhach),‡ which belong to *C. cinerariæfolium*, do not show any structural difference from the flowers grown in their native country.

Besides the usual fluids for clearing up or bleaching the tissues, Schulze's reagent will prove very useful in examining the powder. It will bring out very clearly the hairs and the collenchyma cells, which are stained blue, while the sclerenchyma cells and the pollen grains will as-

sume a yellow color. At the same time, of course, starch, a very common adulteration of insect powder, will become plainly distinguishable, if present.

College of Pharmacy of the City of N. Y., Jan. 11th, 1889.



EXPLANATION OF FIGURES.
Figs. 1-6, hairs on stem and involucre scales of *C. cinerariæfolium*; Figs. 1-4, x 125; Fig. 5, x 91; Fig. 6, x 281. (Horizontal cells from 275-520 micromillimeters long.) Figs. 7, 8, 9, Pollen grains from Dalmatian powder, x 375. Fig. 10, Papilla of marginal corolla (from Dalmatian powder), x 280. Figs. 11, 12, 13, hairs from involucre scales of "Hungarian or Russian daisies," x 280.

Modified Formula for Brown Mixture.

MR. J. H. BUCKINGHAM recommended to the Philadelphia College of Pharmacy at a recent meeting the following mode of preparing the *Mistura Glycyrrhizæ Composita*, which avoids the occurrence of a precipitate and yields a product which has been commended by several physicians:

Purified Extract of Glycyrrhiza.....	1 oz. avoird.
Sugar (Loaf).....	1 " "
Gum-Arabic in Selected Pieces.....	1 " "
Camphorated Tincture of Opium.....	2 fl. oz.
Wine of Antimony.....	1 " "
Spirit of Nitrous Ether.....	1 " "
Ammonia Water.....	1 fl. dr.
Water.....	12 fl. oz.

The mixture of glycyrrhiza, sugar, and gum-arabic is tied up in a bag. Having mixed the other ingredients, with the exception of the ammonia water, place them in a wide-mouthed bottle and suspend the bag in the liquid. In two days the solids will be dissolved, when the ammonia may be added and the whole made to measure one pint by the addition of water.—*Am. Jour. of Pharm.*

"Encrivoir," a solution which easily remove the stains of ink and iron rust, is said to be a solution containing two parts each of alum, tartaric acid, and distilled water.

* Cf. Mariné, l. c., p. 271, and Flückiger, l. c., p. 738.
† L. c., p. 81.
‡ L. c., p. 132.
§ Cf. the note on insect flowers and powders by A. U. Andrus, Pharm. Record, Oct. 1st, 1888, p. 316; also G. M. Beringer, l. c.
¶ It is rather surprising that in J. Möller's excellent book "Mikroskopie der Nahrungs- und Genussmittel" (1886) we should find the statement (p. 55) that in the epidermis of the petals there are no stomata! Cf. De Bary, "Compar. Anat." (Engl. ed.), end of p. 45.
‡ Cf. the abstract from H. Semler's "Die tropische Agrikultur," in AMER. DRUGGIST, Jan., 1887, p. 3.

Testing the Purity of Reagents.

Up to the present time, manufacturing chemists have been in the habit of putting on the market various qualities of chemicals, the better grades of which have usually been distinguished by the designations "purum," "purissimum," "chemically pure," etc. But it is well known that the purity of the articles was only a relative one, there being scarcely any which fully deserved the appellation. It is a well-known fact that when, for instance, "Sulphuric Acid, C. P." is ordered from one of our manufacturing chemists, the question is usually asked: "Do you want the ordinary C. P. acid, or do you want the really C. P., that is, the distilled?" Analytical chemists have, for a long time past, ceased to have faith in the labels of the chemicals which were purchased, even from the best houses, and usually were compelled to work them over if they wanted them really pure.

A little pamphlet has recently been published by Dr. C. Krauch, the chemist of E. Merck, of Darmstadt, in which the decisive tests of purity of the usual chemical reagents are enumerated and discussed. At the same time, the announcement is made that from this time forward the firm would vouch for the purity of their reagents, to the extent of the degree or limits given by Dr. Krauch.

As this subject is of very great importance, and the text of Dr. Krauch's pamphlet contains many data which will be of utility to the next Committee of Revision of the U. S. Pharm., we give its essential portions in translation.

1. *Acidum Aceticum purissimum concentratum* ($C_2H_3O_2$).

Clear and colorless. Spec. gr. 1.064. Every 100 parts contain 96 parts of absolute acetic acid. (Quantitative determination by normal potassa solution.)

Volatile: On evaporating 10 Gm., no weighable residue should remain.

Note.—If larger quantities of strong acetic acid are evaporated, there often remain traces of a residue which is partly combustible (organic). But 50 Gm. of the pure acid should leave, on evaporation, not more than 1 milligramme of residue.

Test for heavy Metals and Earths: On diluting 10 Gm. with water to 100 C.c., the liquid shows no change, neither upon being supersaturated with ammonia, nor after addition of sulphide or oxalate of ammonium, even when allowed to stand for some time in a warm place. On diluting 20 Gm. of the acid to 100 C.c., and mixing it with fresh solution of hydrosulphuric acid, no brown color should be developed.

Test for Sulphuric Acid: Dilute 10 Gm. of the acid with 150 C.c. of water, heat to boiling, add chloride of barium, and set aside for several hours. The liquid must remain clear.

Hydrochloric Acid: Dilute 5 Gm. to 50 C.c., add silver nitrate and nitric acid. No change must occur.

Empyreuma: On diluting 5 Gm. with 15 C.c. of [pure] water, and adding 3 C.c. of a $\frac{1}{10}$ normal solution of potassium permanganate, the tint produced by the latter should not fade within 15 minutes.

2. *Acidum Chromicum Purissimum* (CrO_3).

Small, red, dry crystals. On dissolving 2 Gm. in 20 C.c. of water, a clear solution is produced which, upon addition of some drops of hydrochloric acid and of chloride of barium solution shows no alteration after ten minutes.

Note.—Commercial chromic acid is mostly contaminated with considerable amounts of sulphuric acid and sulphates.

3. *Acidum Citricum Purissimum* ($C_6H_8O_7$).

Large, colorless, transparent crystals, permanent in the air, but efflorescing at a gentle heat, melting at about 165° C., and carbonizing when ignited. Soluble in 0.54 parts of water, 1 part of alcohol, and about 50 parts of ether.

[The reactions given are those of the Pharm. Germ., and need not be quoted here. In subsequent articles we shall omit such portions as can be easily supplemented by consulting the U. S. Pharm.]

4. *Acidum Hydrochloricum purum concentratum*.

Contains about 38% HCl. Spec. grav. 1.190. Clear and colorless; after dilution with water, odorless.

Tests for Sulphuric Acid: a. Dilute 5 Gm. with 50 C.c. of water, and add chloride of barium. No reaction should appear within 12 hours.

b. *Limit*: 100 Gm. of the acid should contain not more than 1 milligramme of absolute sulphuric acid. To determine this, 500 Gm. of the acid are slowly evaporated, on a water-bath, to about 1 C.c., and the sulphuric acid determined in the residue.

Note.—Regarding the tests for sulphuric acid, the author refers to Biltz, who found that acetic acid and acetates interfere least with the barium reaction; hydrochloric and nitric acid interfere most, between the two stand chlorides and neutral nitrates.

[From this it would follow, that acetate of barium would be preferable as a reagent when testing for free sulphuric acid, of course, provided HCl and HNO₃ are absent.]

Volatility.—On evaporating 10 Gm. of the acid, not more than a very minute, and scarcely weighable residue should remain.

Note.—On evaporating larger quantities of the pure acid,

there will almost always be found traces of residue—probably lime derived from the glass and porcelain vessels—also sulphuric acid. The author usually obtained 1 milligramme of residue on evaporating 50 Gm. of the acid in a porcelain capsule. The preparation of an absolutely chemically pure hydrochloric acid is difficult. The author has in vain attempted to procure any from other chemical factories.

Tests for heavy metals, alumina, and lime:

a. Dilute 10 Gm. of the acid with 10 C.c. of water, pour upon this, contained in a test-tube, a layer of 5 C.c. of fresh solution of hydrosulphuric acid, and allow to stand for one hour. At the end of this time, either with or without heat, no color should appear between the two layers, nor a yellow ring (arsenic).

Note.—An acid which stands this test for arsenic is suitable for most analytical purposes. For special toxicological investigations, the absolute absence of arsenic is required. This is shown when several liters, after evaporation with addition of chlorate of potassium, yield no reaction by Marsh's test. According to Otto and Beckurts, an acid of this degree of purity (from arsenic) may be obtained by treating ordinary hydrochloric acid with hydrosulphuric acid or with ferric chloride.

b. Dilute 20 Gm. with water, supersaturate with a slight excess of ammonia, then add a few drops of sulphide of ammonium and oxalate of ammonium. Even on protracted standing, no alteration, and particularly no dark tint, should be produced.

c. On diluting 5 Gm. with water to 25 C.c., and adding a few drops of sulphocyanide of potassium solution, no reddish tint should be produced.

Test for Sulphurous Acid: On adding a few C.c. of the previously diluted acid to water rendered faintly blue by iodide of starch, the color should not be destroyed.

Test for Chlorine. To 5 C.c. of highly dilute solution of starch add a few drops of solution of iodide of potassium, afterwards one drop of diluted sulphuric acid, and then 1 C.c. of the previously diluted hydrochloric acid. No blue color should appear.

5. *Acidum Hydrofluoricum fumans purissimum* (HF).

Hydrofluoric acid is colorless, though sometimes it is found to have a slight tint, which is probably due to long contact with the interior of the caoutchouc container.

On evaporating 10 Gm. in a platinum capsule, and igniting, not more than a minute and scarcely weighable residue should remain. On thus evaporating 50 Gm., this residue should not exceed two milligrammes.

Test for sulphuric acid: Dilute two Gm. with 50 C.c. of water, then add some hydrochloric acid, and a drop of solution of chloride of barium. No precipitate should occur within five minutes.

Tests for arsenic, heavy metals, earths, etc.:

Dilute 10 Gm. to 40 C.c., warm, and pass hydrosulphuric acid gas, which should not produce either a yellow (arsenic) or dark-colored precipitate (heavy metals). On diluting 5 Gm. with 50 C.c. of water, supersaturating with ammonia, and adding [to separate portions] sulphide of ammonium, carbonate of ammonium, and phosphate of ammonium, no cloudiness should occur.

6. *Acidum Hydrofluosilicicum purissimum* (SiF_6H_2).

On evaporating 5 Gm. in a platinum capsule, no residue should remain. If 5 Gm. are diluted with 10 C.c. of water, the liquid mixed with a little hydrochloric acid, and then with solution of hydrosulphuric acid, no precipitate should occur.

On diluting 5 Gm. with 10 C.c. of water, and adding a solution of nitrate of strontium, no cloudiness should appear within five minutes.

7. *Acidum Molybdicum purum*.

A white powder, containing about 85 per cent of molybdic anhydride, and about 15 per cent of nitrate of ammonium and moisture.

A solution of one part of the substance in five parts of dilute ammonia is clear, and is not altered by addition of sulphide of ammonium.

Test for phosphoric acid:

Dissolve 10 Gm. of the substance in 25 C.c. of water, and 15 C.c. of water of ammonia (sp. gr. 0.910), and add 150 C.c. of nitric acid (sp. gr. 1.200). No yellow precipitate (of ammonium phosphomolybdate) should appear within two hours, even when the mixture is exposed to a very gentle heat.

8. *Acidum Molybdicum purissimum, sine ammonia* (MoO₃).

Containing about 100% of the pure acid. This has a faint bluish tint, caused by very minute traces of molybdic oxide.

On adding 2 Gm. to 10 C.c. of water and 5 C.c. of water of ammonia (sp. gr. 0.910), and gently warming, complete solution takes place in a short time. Sulphide of ammonium, added to the solution, produces no change.

Test for phosphoric acid: As in the preceding.

9. *Acidum Nitricum Purum*.

Contains about 33 per cent of the absolute acid, is clear and colorless. Spec. grav. 1.200.

On evaporating 10 Gm. in a porcelain capsule, not more than a very minute and scarcely weighable residue should remain.

The author adds that when larger quantities were evaporated there was always a weighable residue (lime); 50 Gm. of the acid yielded usually 2 to 3 milligrammes of residue.

Many are in the habit of testing for the absence of fixed residue by evaporating a few drops on platinum foil. But this is not sufficient. It is often of importance to ascertain the residue left by larger portions, and in this case this is best done by making a duplicate trial, in a porcelain and in a platinum capsule.

The tests for impurities given by the author are about the same as those in the U. S. P.

10. *Acidum Oxalicum purissimum* ($H_2C_2O_4 \cdot 2H_2O$).

Colorless crystals without any trace of efflorescence.

On igniting 10 Gm. in a platinum capsule, no weighable residue must remain.

The author states that "purissimum" acid occurs in the market which contains potassa, and leaves behind, on ignition, a strongly alkaline residue.

On dissolving 5 Gm. in 100 C.c. of water, and adding a few drops of hydrochloric acid and solution of chloride of barium, no cloudiness or precipitate should appear after standing for several hours in a warm place (absence of sulphuric acid).

A solution of 1 in 10 should not be altered by addition of ammonia and sulphide of ammonium (absence of heavy metals).

Test for ammonia: (a) 2 Gm. are warmed with an excess of solution of soda in a test tube. No odor of ammonia should be given off. Moistened turmeric paper should not be rendered brown by the escaping vapors. (b) 2.5 Gm. are dissolved in 30 C.c. of water, the solution supersaturated with caustic potassa (purified by alcohol), and about fifteen drops of Nessler's reagent added. No distinctly yellow or brownish-red color should be developed.

NOTE.—Oxalic acid containing ammonia has at times been sold in the market.

Note on Sulphurous Acid and Sulphites.

In a recent paper on "The sulphurous acid and sulphite of sodium of pharmacy," published in the *Pharm. Journal* (Jan. 19th), Mr. Barnard S. Proctor criticises the process of assay directed by the British Pharmacopoeia as unnecessarily scientific and troublesome. He suggests an improved method, which yields practically as good results, and is more easily executed by the average pharmacist. The British Pharm. requires liquid sulphurous acid to contain 5 per cent of sulphurous acid gas (SO_2), or 6.4 per cent of real sulphurous acid (H_2SO_3). Upon this basis, Mr. Proctor's process is as follows:

Put into a 1-ounce vial 11 grains of iodine and 15 grains of iodide of potassium, pour upon them 1 fl. drachm (Brit.) of the acid to be tested, rinse the measure with a drachm of water, adding this to the contents of the vial, and shake well. The iodine color should disappear if the acid be of full strength; this, however, is not often the case, and the degree of deficiency may be roughly estimated by adding successive portions of the acid, say 10 minims at a time, until the brown color disappears. [Applied to the U. S. Ph. acid, the above quantities may be altered to 7 grains of iodine, 10 grains of iodide of potassium, and 50 grains of the acid.] One hundredth of a grain of free iodine gives a distinct brownish-yellow color to a drachm of solution, but though this color entirely disappears when there is just sufficient sulphurous acid to convert the iodine into hydriodic acid, a few drops more of sulphurous acid again develop color, this time a lemon-yellow, removable by a small further addition of iodine or a free dilution with water. This lemon-yellow color, produced by any considerable excess of sulphurous acid, need not cause any hesitation in the use of this method, as the difference between the lemon and the brown tint is sufficiently distinct, and the former is accompanied with the odor of free sulphurous acid. In the Brit. Pharm. [and also the U. S. Ph.] the sulphurous acid is diluted with a large bulk of water; but this water requires to be recently boiled and cooled, otherwise the oxygen contained therein would vitiate the results. When the test is performed in the manner above directed, the reaction is quite sufficiently sharp.

Regarding sulphite of sodium, the author recommends a similar method. Take 10 grains of resublimed iodine (assuming this to be pure), put it into a measuring glass or mortar, and rub it with a drachm of water. Then weigh 10 grains of the sulphite, and add the bulk of it to the contents of the mortar, reserving about half a grain; triturate for a moment. The iodine should all dissolve and be nearly decolorized. The addition of the last half-grain should totally decolorize the iodine solution, if the sulphite be in good condition. If decolorization takes place before the last half-grain is added, the salt has probably lost water by efflorescence; and if the brown color remains after this addition, the salt has probably been partly oxidized to sulphate.

Solubility of Sulphite of Sodium.—The author finds the rate of solubility of this salt to differ from that given by the Pharmacopoeias and other authorities.

Recently recrystallized sulphite of sodium requires 1.7 parts of water at 58° F. for solution, and about 100,000 parts of alcohol (Brit. Ph.; sp. gr. 0.838).

ESCHSCHOLTZIA CALIFORNICA AS A SOPORIFIC.

ESCHSCHOLTZIA CALIFORNICA Cham., belonging to the natural order Papaveraceae, is a native of western North America, and is principally found in California. It is a herbaceous, glabrous, glaucescent plant, with alternate, petiolated, many-lobed leaves possessing linear lobes, and no stipules. The flowers are terminal, and are borne on long peduncles. The golden yellow corolla is formed of four sessile, fragile petals. The two valvate sepals are united throughout their whole length, and can be detached, at the base, in shape of a funnel. The fruit is small, oblong, dry, and capsular, longitudinally traversed by ten prominent ribs, and dehiscent, down to the base, into two stiff valves, bearing the seeds at the edges.

According to Green (*Pittonia* I, 43), there are ten varieties of this plant, which differ but little from each other.

Aqueous and Alcoholic Extract of Eschscholtzia.

The following process is given: Reduce 100 parts of the whole plant (root, stem, leaves, flower, and fruit) to as fine a state as possible, and digest it with 500 parts of alcohol of 80%. After six days separate the liquid from the drug by decantation and expression, and filter. Again macerate the drug with 300 parts of alcohol of 80% during twenty-four hours, and pour off the liquid portion. Filter this, concentrate it by evaporation, and add it to the liquid ob-



Eschscholtzia Californica, Cham.

tained in the first operation. Filter the whole, and evaporate, on a water bath, to pilular consistence.

The alcoholic extract thus obtained is very resinous, deep green, and has a strong, very agreeable, and peculiar odor, and a very bitter taste. Every 100 parts of the plant yield about 20 parts of extract, containing about 3 parts of resinous substances.

In the same manner an aqueous extract may be made, substituting water for alcohol. The yield of aqueous extract is 15 per cent.

[Note by Ed. Am. Dr.—As the plant is probably not injured by heat, it will be preferable to dry and powder it, and to use the process of percolation for the purpose of exhausting it.]

Chemical Composition.—It has been ascertained so far, though not yet with absolute certainty, that the plant contains, besides a small quantity of morphine, a larger quantity of another base, and probably a glucoside.

Result of Physiological Experiments.—The latter have shown that the plant, or its abstract, at first accelerates, and afterwards retards respiration; the extract as obtained by the above-given process causes, when given in full dose, a rise of temperature. When it has been deprived of resin, it lowers the temperature. Its action upon the nervous system is only noticeable when it is administered in very large doses.

Therapeutic Effect.—The authors tried the alcoholic extract upon 13 patients, suffering from chronic bronchi-

tis, phthisis, Bright's disease (commencing stage), sciatica, nephritis, and other diseases, giving it first in doses of about 12 grains and gradually augmenting up to about 120 grains. It produced no disagreeable symptoms whatever, except in the case of consumptives, who cannot bear the drug. The extract was administered in syrup of acacia. [Incidentally, the authors say that "in America, the dose of this extract is 2 tablespoonfuls corresponding to 6 grammes of extract for an adult in 24 hours. We think the authors meant to say that the *fluid extract* could be taken in doses of 6 Gm.—Ed. AM. DR.]

The effect produced by the drug is the same as that produced by morphine, without the inconveniences of the latter. Some of the patients took the extract during six consecutive days, and suffered not the least discomfort, nor constipation.

The experiments thus far conducted show that *Eschscholtzia californica* is a valuable and harmless soporific and analgesic, particularly in cases where the use of morphine would be followed by inconveniences.

As it contains, itself, but a very small quantity of morphine, it might be used as a substitute of the latter particularly in the treatment of children.

The authors employ the drug in the following forms, in which we have translated the metric quantities into the nearest approximate U. S. weights and measures:

Alcoholic Potion.

Alcoholic Ext. of *Eschscholtzia* gr. 40 to 150
Rum..... fl. oz. 1
Syrup..... fl. oz. $\frac{1}{2}$

Aqueous Potion.

Aqueous Ext. of *Eschscholtzia*... gr. 48 to 180
Pectoral Infusion..... fl. oz. $\frac{3}{4}$
Syrup of Acacia fl. oz. 1

Pectoral Infusion—Tisane pectoral—is prepared by infusing 1 part of Species Pectorales (see "National Formulary") with 100 parts of boiling water.

Syrup of *Eschscholtzia*.

Aqueous Ext. of *Eschscholtzia*..... tr. oz. 1
Syrup..... tr. oz. 8

Dose: One to 4 tablespoonfuls per day.

Pills of *Eschscholtzia*.

Alc. (or aqueous) Extract of *Eschscholtzia* gr. 800
Excipient..... q. s.

Make 40 pills. Dose: 5 to 15 pills per day.—DR. TER. ZAKARIANTZ in *Bull. Therap.* of January 15th.

Preservative for Milk Samples.

OWING to the fact that milk undergoes rapid changes on keeping, and that it is impossible to withdraw uniform samples from milk which has undergone separation and decomposition, it is necessary that any sample of milk intended for analysis shall reach the chemist without delay, and that the latter shall take it at once in hand. But there are many reasons why some efficient preservative should be found, so as to permit the analysis being performed at any time within a reasonable period after the sample has been taken. Either the chemist prefers a delay, as he may be engaged upon other work which should not be interrupted. Or, he may wish to put aside a sample, so as to be able to check his results in case of doubt. Or, a sample may be put by for future use, perhaps as a corpus delicti in a prosecution or law suit.

With a view towards accomplishing this, Prof. Allen some years ago devised a method to preserve milk with alcohol. But it is necessary to add a large amount of this, and in very exact proportions. Moreover, it is doubtful whether the analysis of a sample so preserved would be of any value in a law court.

Mr. H. Droop Richmond, endeavoring to find a better method, successively tried carbon bisulphide, ether (both of these already used for this purpose by Hehner), dichlorophenol, chloroform, terpenes and hydrofluoric acid. Chloroform which kept the milk in a fluid state, and the fat in an easily miscible condition, proved to be the most unreliable. Carbon bisulphide kept the milk fluid, but allowed the cream to rise so as to form a cake at the top, which could not be easily worked again. Dichlorophenol preserved the milk fairly well, but the cream rose. Ether and terpenes were of little use. But *hydrofluoric acid* [the ordinary acid of commerce], of which 0.5 per cent of the weight of the milk was added, or one drop to every 10 C.c. of milk, preserved the latter almost perfectly. Of course, it precipitated the casein, but a vigorous shake brought this into so finely divided a state that sampling was quite easy, the fat being evenly mixed. There was not the slightest blackening of the total solids after preservation, showing that decomposition had not taken place.

A further trial of this method showed that hydrofluoric acid only exercises a preservative action when added

while the samples are fresh. If decomposition has once commenced, it is of very little use.

The author recommends to add to every sample of milk, at the time of receipt, 0.5 per cent of commercial hydrofluoric acid, and then to securely seal the bottle. The amount is so small that no allowance for increase of volume need be made.—After *The Analyst*, Jan., 1889.

[*Note by Ed. Am. Drugg.*—In the discussion upon this paper it was pointed out that it would be of the greatest advantage if milk could be treated with a preservative at the time when the samples are taken from the dealers' cans. On the other hand, it was deemed improper to permit inspectors or other non-scientific agents to add anything whatever to the milk, as this might invalidate any prosecution. This is, of course, an important point, and cannot be gainsaid. But, possibly, there is a way out of the difficulty, provided that is found that *fluorides* possess the same preservative powers as free hydrofluoric acid. In general, it is known that free acids (such as salicylic, boric, etc.) are more active anti-fermentatives than the respective salts. And this may be the case also with hydrofluoric acid. But, perhaps, an increase of the corresponding fluoride may make up for this. Supposing, then, that this is found feasible, then we would suggest that the authorities procure a uniform style of bottle for samples; that they be made absolutely clean and dry, and that a quantity of, say fluoride of potassium (under proper precautions to prevent access of moisture), be introduced into the bottle, and the latter then securely sealed. When an inspector goes around to collect samples, he takes a number of these sealed bottles with him. Upon entering a place where he wishes to collect samples, he takes out the requisite number of bottles, opens and fills each one to the proper mark, and then seals them up. One of these bottles, according as the law directs, may be handed over to the dealer, or sent to a central authority.]

The Estimation of Glycerin.

DR. OTTO HEHNER recently read a paper before the Society of Chemical Industry on the methods which have been most recommended for estimating glycerin. Two of these methods, viz., by converting glycerin into a lead-salt and that by permanganate, were found so unreliable that it is not worth while to consider them. Among the remaining methods, Dr. Hehner regards the bichromate and the triacetin methods to be the most trustworthy, and he advised both of these to be used, a mean of the results being taken as the percentage of glycerin in the liquid under examination. Although he does not place the ether-alcohol method on a level with the preceding, yet he mentions it, and for the sake of completeness we give all three methods below:

1. *Ether-Alcohol Method*.—In this the glycerin is removed from the liquid by ether-alcohol, and after evaporation the residue of the ether-alcohol solution is weighed as glycerin. Dr. Hehner pointed out several sources of error in this method, more especially that the solvent extracts from the lyes [viz., soap-lyes; in mixtures free from such impurities the results are more exact.—Ed. A. D.] other organic matters, such as fatty acids. Speaking of the volatility of glycerin, he said that experiments which he had made all pointed to the fact that, as long as there was twenty-five per cent of water in the mixture it might be boiled for hours without any loss of glycerin.

2. *Bichromate Oxidation Method*.—In this a measured portion of the sample is treated with bichromate of potassium and sulphuric acid. The glycerin is oxidized wholly to carbonic dioxide (CO₂), which in the original process was measured, and from the factor obtained the amount of glycerin was calculated. Dr. Hehner therefore prefers to determine the amount of bichromate used, and from this to calculate the amount of glycerin present. The standardized solution contains 74.86 grains of pure potassium bichromate per liter, and the check solution 240 grains of ammonio-ferrous sulphate per liter. Seven parts of bichromate are considered to be sufficient for the oxidation of one part of glycerin. With this proportion it is therefore mixed in a beaker, a large excess of sulphuric acid added, and the whole heated until decomposition is complete. The excess of bichromate is then determined by means of ammonio-ferrous sulphate. Several precautions are necessary, chief of which are the removal of chlorine and chlorine compounds with oxide of silver, and the precipitation of impurities with acetate of lead. If these are not removed, the results are a trifle high, but otherwise the method is accurate, easy, and reliable.

3. *Triacetin Method*.—In this the sample is heated with acetic anhydride and dry sodium acetate, an inverted condenser being used to insure the return of all free acid which may distil; when the reaction is complete, the mixture is filtered from insoluble matter, a portion of the filtrate saturated with alkali in excess, and immediately titrated back with standard acid. The precautions which must be observed in this process are that the sodium acetate must be perfectly dry, otherwise the glycerin is imperfectly converted owing to hydrolysis, which increases with time. Alkali has even a greater effect in this direction, hence the titration must be conducted as rapidly as possible.—After *Chem. and Drugg.*

Note on Expressed Oil of Almonds.

THE Pharmacopœia Committee of the Germ. Pharm. Association has recently published a new series of improved descriptions and tests. Among these is the following on expressed oil of almonds, which we reproduce here, together with the commentary (after *Arch. d. Pharm.*, 1888, 1,111).

Oleum Amygdalarum.

The fixed oil of the seeds of *Prunus Amygdalus*. Light-yellow, remaining clear at -10° , of a mild taste, and having the spec. grav. 0.915 to 0.920. On briskly shaking 1 volume of fuming nitric acid with 1 volume of water and 2 volumes of the oil, a whitish, not red or brown, mixture should be produced, which, after a few (inside of six) hours separates into a firm, white mass, and a scarcely colored liquid.

If 10 parts of the oil are digested with 15 parts of solution of soda [sp. gr. about 1.160] and 10 parts of alcohol [sp. gr. 0.838], until the mixture has become clear, then 100 parts of water be now added, and the whole supersaturated with hydrochloric acid, an oily layer separates. If this is removed, then washed with warm water, and rendered clear over a water-bath, it will remain liquid at 15° C. This oil should yield, with an equal volume of alcohol, a clear solution, which should not separate any fatty acids at 15° C., and which should not be rendered turbid on being diluted with an equal volume of alcohol.

Commentary. As has been shown by Peters, the genuineness of the several fixed oils may be, at least partly, judged, from the melting and congealing points of their respective fatty acids, and from the solubility of the latter in alcohol. These criteria are particularly useful in the case of oil of almonds, since it consists almost entirely of oleate of glyceryl, while the more common adulterants of it, viz., peanut, cotton seed, and sesame oils (as well as olive oil), contain, besides, more or less of the glyceryl compounds of palmitic, stearic, and arachic acids. Hence the melting points of the fatty acids extracted from the latter are higher, and at the same time they are less soluble in alcohol.

The melting points of the fatty acids of the above mentioned fatty acids are given as follow:

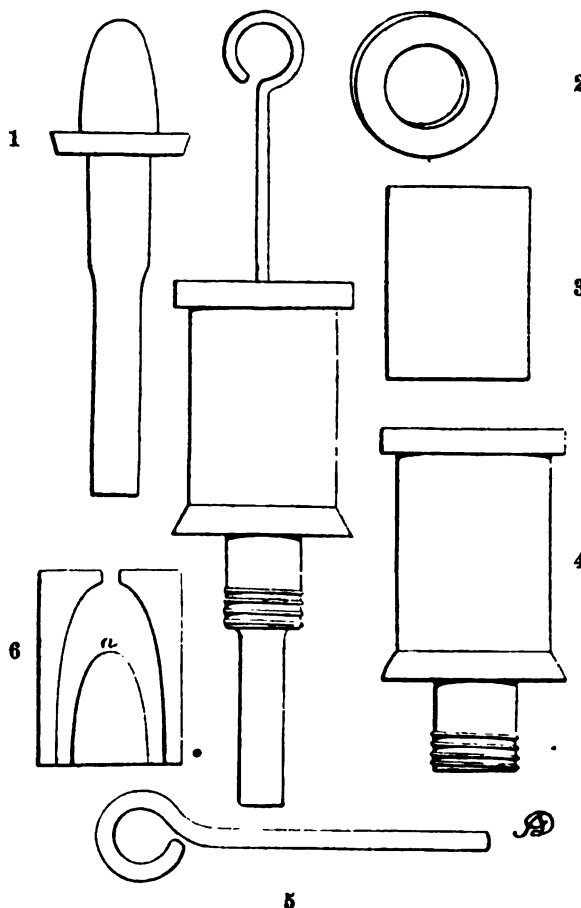
From oil of almonds	at	14.2° C.
" " olive	"	$24-29^{\circ}$ C.
" " sesame	"	$23.5-35^{\circ}$ C.
" " peanuts	"	$26.5-35^{\circ}$ C.
" " cotton seed	"	$32-43^{\circ}$ C.

It has been found that admixtures of olive, sesame, cotton-seed, and peanut oil, in quantities more than 50%, may be recognized with certainty by the congelation of the separated and clarified fatty acids at a temperature of 16° to 17° C. Smaller admixtures are still recognizable from the fact that the alcoholic solution of the fatty acids (1 in 2), at 16° C., separates particles of fatty acids. Pure oil of almonds, as well as oil of peach kernels (which latter is, however, discovered by the elaidin test), furnish an oleic acid which does not separate any solid fat at 15° C., even after standing for many days, and the alcoholic solution of which (1 in 2) remains permanently clear at 15° C.

We have, therefore, here a method to detect any addition of the foreign oils down to a percentage of 20. The best mode of proceeding is as follows: Put 10 Gm. of the oil of almonds to be tested, together with 15 Gm. of solution of soda (see above), and 10 Gm. of alcohol into a flask holding about 150 C.c., and heat upon a water-bath to a temperature short of reaching the boiling point, to prevent spattering of the liquid, when the latter is gently agitated. When the saponification is completed after 15 to 30 minutes, and the liquid has become clear, 100 Gm. of warm water are added which produces a perfectly clear solution, if the oil was pure and the soda solution of proper strength. After supersaturation with hydrochloric acid, the oleic acid separates. This is made to collect in the neck of the flask, for which purpose sufficient water is added, if necessary. The oily layer is now carefully removed, the flask cleaned, the oil replaced therein and thoroughly agitated with warm water. Enough water is now added to bring the layer of oleic acid again into the neck, and the flask then placed into hot water, until the oily layer is perfectly clear, which sometimes requires several hours. The layer is next transferred into a dry glass, and kept for some time at 15° C. If the oil of almonds was pure, the oleic acid remains permanently clear, but congeals if the temperature falls to 14° or 13° C. On adding to 1 C.c. of the liquid oleic acid 1 C.c. of alcohol (0.838), a clear solution is produced, which remains permanently clear if the test-tube is stoppered and set aside for some hours at a temperature of 15° C. Addition of 20% of oil of olive, or cotton seed, or sesame, or peanut are shown by the separation, during this time, of small portions of solid particles. With larger proportions of foreign oils, the quantity of these increases. Finally, the alcoholic solution of the oleic acid above mentioned (amounting to 2 C.c.) is diluted with 2 C.c. more of alcohol, when it should remain clear. The object of this test is to prove the absence of paraffin oil. If the oil of almond contained, originally, more than $\frac{1}{4}$ of paraffin oil, it

does not produce a clear soap solution upon saponification. But small portions of the adulterant accompany the soap as well as the separated fatty acid up to the moment when the second dilution with alcohol is made, when it shows itself by rendering the liquid cloudy. But the amount of alcohol must not be increased, since a separation or cloudiness would then occur even if the oil had been pure.

The above method does not permit the detection of oil of poppy or of sun-flower, since the fatty acids of these oils possess a melting point and solubility in alcohol but little differing from that of oil of almonds. Oil of poppy, however, is detected during the elaidin test both by the brownish color of the congealed oil, and by the liquid portion, which is either mixed with it or floats above. In the proposed pharmacopœial text above given, the elaidin test has been modified so as to direct parts by volume, in place of parts by weight. Further the quantity of oil, as compared with acid, has been decreased, since with the new proportions, even the fixed oil obtained from *bitter almonds* will congeal after 5 or 6 hours. With the old proportion this required often 1 or 2 days. At all events, more attention should be paid to the quality of the fuming nitric acid, since the whole success depends on the amount of hyponitric acid contained therein.



IMPROVEMENT IN SUPPOSITORIES.

A. WYBRANT describes an apparatus for making suppositories [or pessaries, as he terms them], which may be described as follows: A piece of metal having a conical head and collar, of the form shown in Figure 1, gives form to the cavity of the suppository. A collar (Figure 3) is placed over the cone and upon the fixed collar, and these are inserted into the cylindrical piece (Figure 2), which forms the outer surface of the suppository. All these are dropped into the cylindrical box shown in Figure 4, when the apparatus is ready to receive the suppository mass. Figure 6 shows a section of 1 and 2, and the hole in the top of the latter, through which the melted suppository mass is to be poured. A piece of wire (Figure 5) serves to clear the opening when it becomes clogged. The whole apparatus is shown in the central figure. The melted ingredients having been poured in, and sufficiently cooled, the outer case is removed, the outer mould taken off, and the suppository taken from the cone with the aid of the detachable collar. The object of the cavity is for the insertion of the tip of a finger to facilitate the introduction of the suppository into the bowel or vagina, or to hold a medicinal substance, in which case the opening may be closed with a disc of the suppository mass.—*Pharm. Jour.* [It is our belief that the form of a hollow suppository such as is here described is covered by a patent.—[ED. AM. DRUGGIST.]

Substitute for Indian Cholagogue.—Sulphate of quinine, 2 drs.; fluid extract of leptandra, 2 drs.; saturated tincture of stillingia, 4 oz.; fluid extract of podophyllum, 3 drs.; oil of sassafras, 10 drops; oil of wintergreen, 10 drops; molasses sufficient to make 8 fl. oz.

[ORIGINAL COMMUNICATION.]

THE ART OF DISPENSING.

[Continued from page 25.]

CARE OF POISONS.

NOTHING connected with the practice of pharmacy appeals so strongly to the sentiments of the public as the fact that the proprietor of a drug store is the custodian of substances, some of which are of such virulent nature that they are capable, even in minute doses, of destroying life, and the majority of which require to be used with more or less circumspection. It is an appreciation of this fact by the general public which justifies legislative restriction of the right to practise pharmacy to those who are proved to possess a requisite degree of knowledge concerning the wares which they handle. Where no such legal restriction is enforced, years of painstaking business are a necessary preliminary to an established reputation, and even then one notable misadventure will sometimes ruin the financial prospects of any establishment, and create suspicion on the part of many per-

1. That in the keeping of poisons, each bottle, vessel, box, or package containing a poison be labelled with the name of the article, and also with some distinctive mark indicating that it contains a poison.

2. Also that in the keeping of poisons, each poison be kept on one or other of the following systems, viz.:

(a) In a bottle or vessel tied over, capped, locked, or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop, or dispensary; or

(b) In a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop, or dispensary; or

(c) In a bottle, vessel, box, or package kept in a room or cupboard set apart for dangerous articles.

3. That in the dispensing and selling of poisons, all liniments, embrocations, and lotions containing poison be sent out in bottles rendered distinguishable by touch from



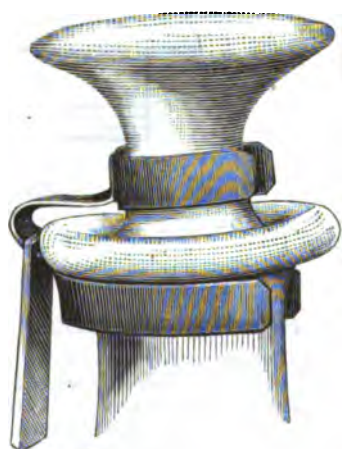
Bottle-cage.



Alarm-bell.



Electric signal.



Stopper clasp.



Puzzle-cap.



sons that no pharmacist is to be trusted. There are urgent reasons, therefore, why every pharmacist should adopt safeguards in the care and dispensing of poisons which will, as far as possible, reduce the chances of accident to a minimum.

We have already mentioned some things connected with the art of dispensing which have for their basis the necessity for exercising extreme caution in this particular, but there remain some things which may be added.

The German government, to insure the attention of pharmacists to the greater care required in the use of certain remedies, has arranged the articles of the Pharmacopœia as follows:

TABLE A.—Designating the largest dose for an adult, which the physician must not exceed in his prescription, when intended for internal use, except he adds the exclamation point (!).

TABLE B.—Containing the names of medicines which are usually called poisons, and which must be preserved VERY CAUTIOUSLY under lock and key.

TABLE C.—Names of medicines which must be kept CAUTIOUSLY and separately from the others.

The Pharmaceutical Society of Great Britain, at a general meeting of the Society, held May 17th, 1871, adopted the recommendations:

ordinary medicine bottles, and that there also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.

To judge by the numerous reports of poisoning by misadventure published in British journals, it would seem that these latter recommendations cannot be much regarded.

While there is no uniform custom adopted in this country, most pharmacists exercise caution, and to this end adopt one or another of the methods above enumerated or some system peculiar to themselves. For example: It having, with much justice, been claimed that the source of mistake is lack of attention on the part of the dispenser; that anything which distracts the attention from the work in hand is liable to result in mistakes, and that no system, however elaborate it may be, will guard against the blunders of one whose "wits go woolgathering," it has been the practice of some to keep poisons in the original containers, and stow them "helter-skelter" in drawers or closets by themselves, so that some little concentration of thought is required to find exactly what is wanted. A great disadvantage connected with system—if it may be so called—is the loss of time and the uncertainty which

must exist as to whether certain articles are in stock, or whether the supply is exhausted.

Still others adopt the practice of placing the original package of each active poison in a porcelain jar and keeping these jars in a case by themselves, and at a little distance from the dispensing counter.

Much ingenuity has been shown during a few years past in contriving bottles which may be locked automatically in place or whose stoppers may be sealed with some contrivances which will insure more than ordinary attention to details in opening them. Still others are provided with an attachment which will ring an alarm either on the container itself or in some other part of the store. Illustrations of a number of these contrivances are shown in this connection, and there are many more having features more or less similar.

Albert Greenwood, of Maysville, Ky., patented a wire cage for inclosing a bottle so that it requires to be opened by liberating a catch before the bottle can be removed.

A German patent provides for a metallic case to be cemented to the bottom of a dispensing bottle, and containing a bell which will be rung by a loose clapper whenever the bottle is moved. In the device proposed by Fred. Stockton, of Wheeling, W. Va., a metallic spring clasp incloses the neck of the bottle, and holds the stopper in place until the clasp is removed by pulling upon the tag which depends from one side. Rather better than this is one of English origin, in which the attachment to the neck of the bottle is permanent, the stopper being unlocked by withdrawing a slide.

J. B. Howell, of Newton, N. J., is the patentee of a bottle-cap in which an interior spur or lug prevents the removal of the cap, unless it is rotated so that the lug follows the direction of the zigzag groove in the neck of the bottle.

Still another variety of apparatus is that of Schuch and Wiegel, of Berlin, in which raising the bottle from the base shaped to receive it forms a connection in a galvanic circuit, and this causes an alarm-bell to ring, or a colored disc or other signal to be displayed at the prescription counter, until the bottle is returned to its proper place. The latter would, of course, be the preferable arrangement, as it would avoid alarming customers.

Lastly, the requirement of the German government that the most active poisons (those coming under Table B, above referred to) should be kept under lock and away from other articles, has been more or less adopted voluntarily in this country.

A cupboard intended for this purpose is the invention of Mr. Holbe, an apothecary of Berlin. As shown in the illustration, each set of poisons has a compartment by itself, together with the scales, spatulas, and other utensils required for their manipulation. Even when the outer door is opened, a separate key is required to get at the particular poison wanted.

Mr. Henry Biroth, of Chicago, has suggested a somewhat similar, but more capacious closet. In it are compartments capable of holding all the really active poisons met with in a pharmacy, although the case measures only twenty-seven inches high, twenty-four inches broad, and five inches deep. According to the inventor's arrangement, No. 1 holds all the original packages of morphine; No. 2, the preparations of morphine; No. 3, opium preparations; No. 4, the cyanides; No. 5, poisonous mercurials; No. 6, arsenicals; No. 7, strychnine and its poisonous compounds; No. 8, belladonna, aconite, gelsemium, and apomorphine; No. 9, the stronger acids and some miscellaneous articles, and No. 10, veratrum digitalis, codeine, veratrine, hyoscyamine, and other alkaloids.

It has been suggested that sulphate of morphine might be colored with some harmless substance which would prevent its being mistaken for sulphate of quinine, but this has not met with approval. In October, 1885, the editor of the AMERICAN DRUGGIST suggested that morphine might readily be compressed into a square or oblong disc, with a consistence which would admit of its being handled or transported without loss. Each of these cakes, as a matter of convenience, might be made to contain exactly $\frac{1}{2}$ ounce. These might also, by the same process, be made

to bear the name of the substance and of the manufacturer, so that any person able to read would recognize the nature of the article, and there would be little likelihood of its being mistaken for something else.

[To be continued.]

Tinctura Quillajæ N. F.

At a recent meeting of the North British branch of the Pharm. Society, Mr. J. Rutherford Hill referred to the tincture of the U. S. National Formulary. During the process by which this is made, the soap bark is boiled with the menstruum. For a substance containing a glucoside, this process seems to Mr. Hill to be unscientific, and, as Mr. Boa has shown, saponin is under these circumstances changed. Mr. Hill had prepared two tinctures, one by the American process, the other by cold maceration and percolation. These were examined, and it was found that the tincture prepared in the cold yielded 4.28 per cent of extract, and 2.63 per cent of saponin. The American tincture gave 4.02 per cent of extract, and 2.30 per cent of saponin. A further percolation of the marc of the first tincture indicated that it was practically exhausted, but it was found that the American was incomplete. There was a popular impression, he said, that when heat was used the tincture froths and emulsifies better. Results show, however, that this is fallacious. On the whole the American process is tedious, the cold process shorter, and he suggested macerating and percolating with mixed spirit and water equal to the strength of proof spirit. The American strength of spirit is too low.—*Chem. and Drugg.*

Note.—While the primary object of the Tinctura Quillajæ of the N. F. was to furnish a good emulsifying agent, yet the note attached to the article, that "each fluidrachm represents 10 grains of quillaja," would leave it to be inferred that the tincture is supposed to contain all the useful constituents of the bark. This is, indeed, not the case, and our British critics are correct in pointing out the features which require correction. Meanwhile it may be noted that if the tincture is required for emulsifying purposes within a short time after being prepared, there is no objection to follow the process of the N. F. But if it is to be made for stock, it would be preferable to make it by percolating quillaja,

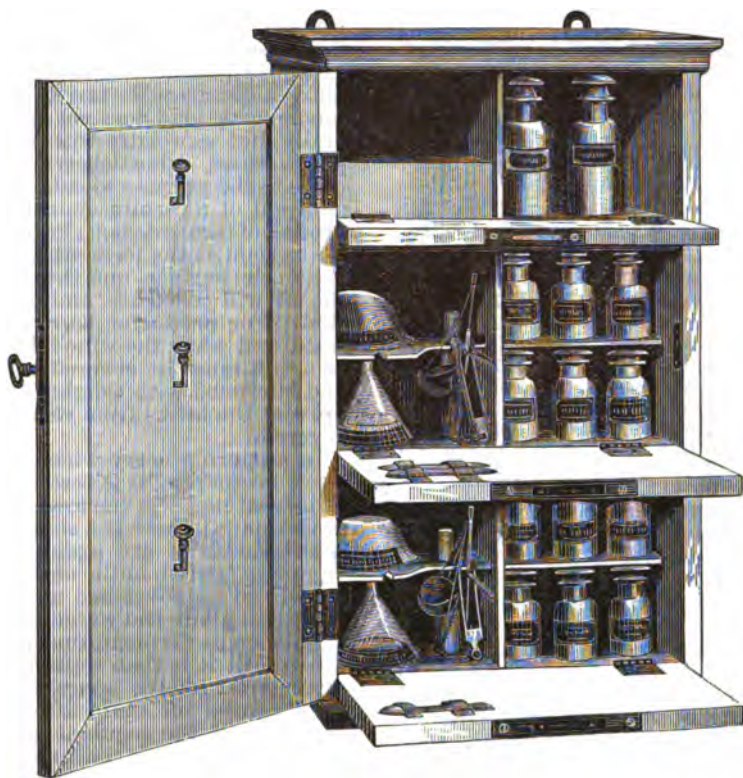
in fine chips, with a menstruum composed of 1 volume of alcohol and 2 volumes of water, so as to obtain the intended strength of the tincture of the N. F.—*Ed. Am. Dr.*

Spanish Eucalyptus Oil.

THE *Eucalyptus globulus* Labill. is the one variety of the more than one hundred and sixty known varieties of the Australian Eucalyptus tree which has been widely acclimatized throughout Europe. In Spain this variety is being planted on a larger scale every year. In addition to the numerous ornamental eucalyptus plantations, and the trees planted in swampy neighborhoods for hygienic reasons, a land-owner in the province Valencia commenced to grow eucalyptus trees on a large scale for forestry purposes. At present he has under cultivation 17 hectares, or, say, 42 acres, containing about 40,000 trees, which at the age of between twelve and fifteen years are cut down every winter in the months of January and December, new trees being planted in their place in February and March.

On the Valencia plantations, the yield of oil from the leaves has been very insignificant, amounting only to between 1 and 3 cwt. per annum. A trial shipment of Spanish eucalyptus oil was consigned to London last autumn, and sold at 1s. 10½d. per lb., a price at which distilling does not seem to pay. The distiller will not, therefore, send over any further shipments.—*Chem. and Drugg.*

Curwin's Hog-Powder.—G. C. Caldwell, of the Cornell University laboratory, reports the composition of a sample examined by him, to be: Moisture, 1.16; sulphur, 4.33; sulphate of iron (copperas), 4.55; sulphate of lime (gypsum), 6.89; chloride of sodium, 77.74; carbon, 3.53; silica, 1.64; phosphoric acid, a trace. That is to say, it is a mixture of salt, sulphur, charcoal, and copperas, for which the retail price of 25 cents a pound is rather high.



Holbe's Poison Cupboard.

Wine from Berries and from Dried Grapes.

FOR the manufacture of a good domestic beverage different sorts of fruits, the residuum of pressed grapes, wine lees, berry fruits (also some kernel fruits, as cherries and plums), and dried grapes may be used.

WINE FROM BERRIES.

Currants and gooseberries yield almost every year a good crop, and even on a small area of land they furnish so much fruit that, by adding the necessary water and sugar, a great quantity of wine can be produced. Whortleberries are very abundant in some districts. The price of sugar being rather low, the expenses are but small. For 1 hectoliter (nearly 26½ gallons, wine measure) of good domestic beverage, sugar for only about \$1.75 to \$2 is wanted. Berries contain too little sugar and, with the exception of thoroughly ripe blackberries and sweet cherries, too much acidity. The acid must, therefore, be reduced and sugar added. If too little water is used the wine becomes too sour. The wine becomes stronger or weaker according to the quantity of sugar added. By adding too little sugar the wine becomes weak and not durable. The subjoined table shows the average contents of sugar and acid in the different sorts of fruit, and also the addition of water and sugar necessary for 10 liters of juice or 11 kilogrammes of fruit, in order to make either a weak kind of artificial beverage, a good table wine, or a liquor wine.

Fruits.	Contents in 100 parts of fruit.		Addition to 10 liters juice, or 11 kilogrammes of fruit.					
	Sugar.	Acidity.	Water - liters.	Sugar—Kilogrammes.				
				Domestic Beverage.	Table Wine.	Strong Wine.	Liquor Wine.	
Currants.....	6.4	2.1	30	4.2	5.8	7.4	1.8	
Gooseberries.....	7.0	1.4	18	2.7	8.7	5.1	8.8	
Blackberries.....	4.0	0.2	—	0.8	1.2	1.6	3.0	
Whortleberries.....	5.0	1.7	24	3.6	6.0	6.3	11.0	
Raspberries.....	3.9	1.4	18	3.0	4.1	5.2	9.1	
Strawberries.....	6.3	0.9	8	1.6	2.8	3.0	5.5	
Red Bilberries.....	1.6	2.8	35	5.3	7.1	8.9	15.2	
Agriot Cherries.....	7.5	1.3	16	2.4	3.4	4.5	8.1	
Sweet Cherries.....	10.0	0.4	—	0.2	0.6	1.0	2.4	
Plums.....	6.1	0.8	6	1.3	2.0	2.6	4.8	

From the stone fruits the stones are to be removed before weighing them, and before fermentation takes place. Strawberries, gooseberries, blackberries, and agriot cherries are particularly qualified for strong and fine wines. For the purpose of washing the berries and removing the stones, the fruits may be grated through sieves, the holes of which are small enough not to allow the passing through of either berries or stones. Then the mashed fruits are to be pressed out or soaked in water, as will be described below. The latter proceeding is, of course, only possible with fruits which require a large quantity of water. During the process of mashing and pressing the fruits, great care is necessary to prevent the contact of iron with the juice, as even very insignificant particles of it will give a bad taste and muddy color to the wine. Iron wine-presses and the lower part of the spindles are to be painted with iron varnish. In order to avoid the solution of iron the soaking out of the residuum of grapes is to be preferred to the pressing. Sieves made of brass are preferable, but must be kept very clean. The riper the fruits the better the wine will be. Rotten fruits must be removed as much as possible.

Fermentation will be quicker the nearer the degree of heat is to 30°, but the danger of the formation of the acetic acid, lactic acid, slime, etc., increases with the heat. If the residuum is not kept in the liquid, it often grows very hot by contact with the air, and injurious decompositions are formed. The more favorable degree of heat for fermentation is 15° to 20° C. (12° to 16° R.).

Berries picked in the hot part of the day are warm, and if gathered in large quantities in receptacles they often become very hot. In these warm, partly already injured berries, an alteration can take place which is injurious to the wine produced therefrom. Such fruits which ripen in summer should, for this reason, be picked in the morning or evening, or on a cool day. In no case should they remain for any length of time in large, filled-up receptacles.

If the mash is too warm, it ought to be brought to the correct degree as soon as possible, by adding cold water. There are cases where great quantities of grape-wine were spoiled only because the grapes, though of very good quality, had been harvested in the heat and transported a long distance. In those years in which the grapes are harvested in very warm weather, there are always more poor wines than when the grapes are cool before they are put into the tubs. It has been observed that fermentation does not commence soon if the berries are picked soon after rain.

If the alcoholic fermentation at the correct degree of

heat does not sufficiently commence within twenty-four hours, there is danger that mucilage or lactic acid will be formed, or, in case of slow fermentation, even vinegar formation. The fermentation can be produced by adding compressed, artificial dry yeast, or fluid corn yeast, 50 grammes of the former or ¼ liter of the latter to 1 hectoliter. These are in the first place added to 1 part of the mixture of sugar, water, and juice or mashed fruits. As soon as this is in good fermentation, it is mixed with the rest of the mash. As a matter of course, only the very best and freshest of yeast is to be used. Yeast of beer is of no use.

One of the great difficulties in preparing berry wines is caused by a too slow and often incomplete fermentation. This is produced either by the mash having been filled into a barrel smoked with sulphur, or by the formation of acetic acid at the beginning of fermentation, or, also, by the berries not containing sufficient nutritious matter in proportion to the yeast necessary for the fermentation of the sugar.

Fermentation will be greatly accelerated by adding currants or raisins, or cristated currants to the mixture of berries or their juice with sugar-water. From 1 to 2 pounds of currants or raisins may be added to 10 liters or 11 kilogrammes of fruit. They must be quickly washed with cold water, then cut, added to the mixture of juice and sugar-water, and left therein during fermentation. For 1 pound of raisins, ¼ liters more of water may be added.

The air is to be carefully excluded from the surface of fruits left standing after having been either lyed or washed, and also during or after the process of fermentation, else a part of the alcohol will turn into acetic acid, causing the wine to remain muddy or slimy, and to acquire a disagreeable taste. Besides this, wine containing much acetic acid does not agree with many persons. Generally, but especially with fleshy or slimy fruits, such as gooseberries, whortleberries, cherries, plums, etc., it is quite to the purpose to submit the mashed fruits, with an addition of a certain quantity of water and sugar, to the process of fermentation; but this requires great precaution, for as soon as the fermentation commences the husks will get on the surface, and thus form a loose mass into which the air will penetrate, and in a short time produce acetic acid. For producing berry wines or red wine on a large scale, and when the wine ferments on the husks, the mash in a tub must be covered with a perforated tub-bottom and burdened with weights or tightly fastened in order to prevent the husks from rising, and then the whole may be covered.

In preparing berry wine on a small scale, but yet up to 1 to 2 hectoliters, it is best to use vessels of stoneware for fermentation. On the lower part of these vessels (as used in Germany) there is a sink-bottom and the mashed fruits contained in it are again covered with a similar one. Water is poured in the channel on the upper part of the vessel and the cover laid upon it. The border of the cover must reach into the water and entirely exclude the air.

As soon as fermentation has commenced, the liquid is drawn off; it is then replaced by sugar-water, poured off again after twelve hours, water is first poured on it and then poured off again after a lapse of time. This is repeated until the required quantity of water is spent. If correctly executed, the husks are so thoroughly washed that it is altogether useless to press them. In the fluid collected in a tub or bottle, the corresponding quantity of sugar not yet used is dissolved. Wines of blackberries, strawberries, sweet cherries, and other fruits for which little water is used, may be left in these vessels until fermentation is completed. For the fermentation of fluids, vessels of glass may be used to advantage. Such air-tight vessels have been tried repeatedly and proved excellent. Grape and berry wines remained in a warm room in partly-filled vessels, without being in any way injuriously affected by the air.

The family (home) beverage and the table wine must, as soon as fermentation ceases, be drawn off the lees and filled into a slightly sulphurated tub. The strong wines and liquor wines may be left on the lees until they are quite clear, and then they are likewise to be filled into a slightly sulphurated tub, but they are bottled only when they do not thicken or ferment any more.

For the preservation of wines in bottles intended to stand, bottles with patent wire locks are to be selected, or else, after the tops of the corks are cut off, and when quite dry, the heads of the bottles must be dipped into hot paraffin.

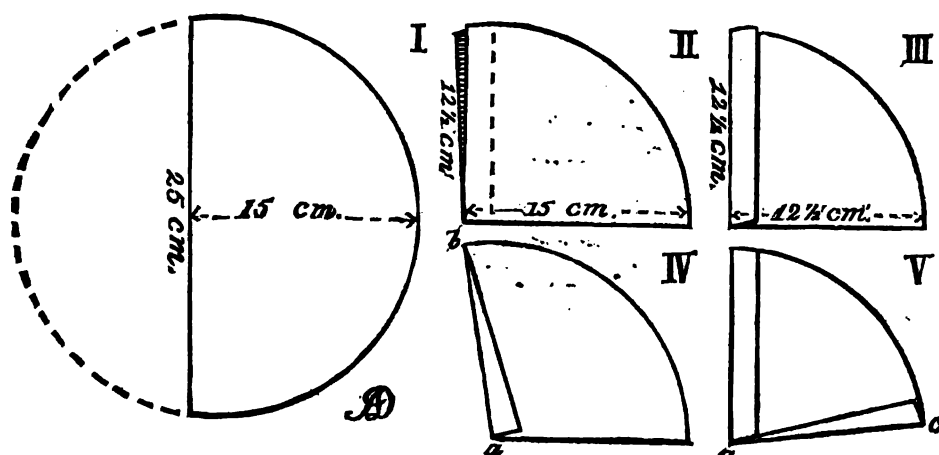
DOMESTIC BEVERAGE FROM RAISINS.

One hundred kilogrammes of raisins are placed in a tub and cold water enough is poured over them just to cover them. After the lapse of twenty-four hours, the fluid is to be drawn off in a tub. The now sufficiently soaked raisins are then pounded or pressed through a sieve provided with such wide holes that whole berries cannot penetrate; water is then poured over them, and removed after twenty-four hours. This is to be repeated until 4 or 5 hectoliters of water are collected in the tub, according to the strength wished for the beverage. The fluid is then left to ferment. The most favorable degree of heat for this is 15° to 20° C. (12° to 16° R.); a much higher or lower degree is to be avoided. If fermentation does not begin within twenty-four hours, then 100 Gm. of good compressed yeast, or ¼

liter of good liquid grain yeast are to be added to the hectoliter. Yeast of beer is not fit for use, but from 1 to 10 liters of yeast from good wine may be added to 1 hectoliter, provided it be very fresh and the wine has not been drawn off from it too late, at least in the beginning of February. Old, and especially slimy wine yeast is to be carefully avoided, as it would make the beverage slimy and not clear. As soon as fermentation ceases, the beverage is to be drawn off from the lees and put in a tub slightly sulphurated, one slice for 10 hectoliters.

If the beverage is desired to be a little astringent, which would render it more refreshing, 100 grammes of tartaric acid would have to be dissolved in a hectoliter. In the season of currants, to 100 kilogrammes of raisins about 10.15 kilogrammes, or to 1 hectoliter of domestic beverage before, at, or after the fermentation, 3.4 kilogrammes of mashed berries, or 3.4 liters of juice of currants may be added. In a similar way sour grape wine or cider, or mashed ripe and green apples (fruit fallen off the trees), or their juice, may be used.

The greatest cleanliness is to be observed in regard to all the vessels or receptacles into which currant wine or domestic beverage is put. The air is to be kept off carefully from the surface of the water on the raisins and from the fermenting and fermented fluid. The tub is to be covered with a lid; the bung-hole is to be closed with a clean sand-bag, as long as fermentation lasts, and then by a well-fitting bung. Store barrels must be kept full as much as possible, and must be bunged up with bungs of acacia or oak wood, reaching at least 15 centimeters into the cask. Wrapping the bungs and corks in rags is to be avoided. For barrels on tap, fungus guards must be used, or the bung, after each drawing off, must be firmly fastened again. All bungs must be kept free of mould, fungi, or other injurious mushrooms, which, especially after this, are apt to spread over the beverage or wine. For this purpose the bungs are now and then to be dipped into spirits of wine, entirely free of bad liquor, or, better yet, into a solution one part of bisulphite of calcium, which may be kept in the cellar ready for use in a bottle with glass stopper.—E. JOHNSON, in *U. S. Consular Reports*.



IMPROVEMENT IN PAPER FILTERS.

MR. EDO CLAASSEN describes, in the *American Journal of Pharmacy* for February, an improvement in construction of paper filters which effects an economy of two-fifths in the paper necessary—an item of some moment when the finest grades of paper are used—and increases the rapidity of filtration, since but a single thickness of paper is employed. [This is not in accordance with the general belief that filtration is more rapid through a double than through a single filter.—ED. AMER. DRUGG.] His directions are as follows:

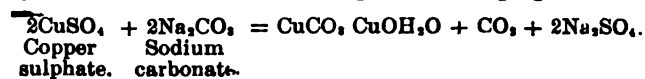
Patterns (corresponding with the size of the filters wanted, for instance with such having a radius [semi-diameter] of 12½, 17½, 22½, 27½, 32½, 37½, 42½, 50, 60, 80, and 100 centimeters) are constructed from circular discs of tinned sheet iron of the same size, by cutting off somewhat more than one-half of the disc (see Figure 1), through a point distant from the edge 15, 21, 27, 33, 39, 45, 51, 60, 72, 96, or 120 centimeters. The small section of the disc, if of no use for smaller patterns, may be rejected. Such a pattern is placed on a sheet of paper, a piece of which is then cut off by allowing the scissors to go around on the edge of the tinned iron. This piece is now folded once in such manner that one part entirely covers the other (Figure 2). It is then folded so far on the straight open side that both the straight sides now presented are of equal length. The narrow-folded side (2½ centimeters in the case of the smallest size mentioned) is folded once more, after which the filter is ready for use. If the funnel has a wider angle than 60°, the filter may be made to fit by folding the narrow part in the direction from *a* to *b* (Figure 4); if, however, the angle of the funnel be smaller than 60°, the filter may be made to fit by folding the closed side in the direction *a c* (Figure 5).

Soldaini's Reagent for Glucose.

THE Committee on Sugar of the Association of Official Agricultural Chemists, at their last meeting presented a report, through Prof. Stubbs, in which, among other interesting matters, the methods for determining invert sugar [fruit-sugar; equal molecules of dextrose (or glucose) and levulose] were discussed. It was pointed out that Fehling's solution and all reagents of similar composition were affected by the drawback, that they are not only reduced by invert sugar, but also by dextrin, and sometimes even by sucrose (or saccharose, that is, pure cane-sugar). After a certain time, they undergo alteration (if kept mixed), depositing oxide of copper, especially if exposed to light.

Attention was then directed to a reagent, proposed by Soldaini, for the determination of invert sugar (and of course for glucose in general), which does not possess these objectionable qualities, at least so says Degener, who has studied carefully its properties.

This liquid is prepared, according to Degener, in the following manner:—40 Gm. of sulphate of copper are dissolved in water, and in another vessel, 40 Gm. of carbonate of sodium are also dissolved in water. The two solutions are mixed, and the copper precipitated in the state of hydrobasic carbonate according to following equation:—



The precipitate is washed with cold water and dried. This precipitate (15 Gm.) is added to a very concentrated and boiling solution of bicarbonate of potassium (about 415 Gm.) and agitated until the whole is completely, or nearly, dissolved; water is added to form a volume of 1,400 C.c., and the whole mass heated for two hours upon a water bath. The insoluble matter is filtered off, and the filtrate, after cooling, is of a deep blue color, and has a density of about 22.5° Beaumé (spec. grav. 1.185). The sensibility of this liquid is so great that it gives a decided reaction with 0.0014 Gm. of invert sugar. The presence of sucrose in the solution renders this sensibility still more delicate.

Ammoniacal salts are not hurtful to the reaction, but they do sometimes retain in solution a slight quantity of copper.

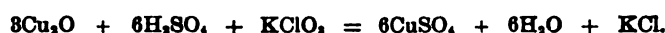
It is then indispensable to boil the solution for five minutes at least in order to drive off ammonia. The quantitative test for sugar is made in the following manner: 50 C.c. of Soldaini's solution are boiled for five minutes upon a water-bath, and 15 C.c. of the sugar liquid (containing 100 Gm. of matter in 100 C.c. of water) added, and boiled again for five minutes. After a rapid cooling the liquid is thrown upon a Swedish filter and washed with water until every trace of a blue color disappears. Then the paper is removed and the precipitate examined, which should be of a clear red color.

[The amount of cuprous oxide thus obtained may be estimated by modifying the process slightly in the following manner. Instead of using a Swedish filter, employ a Gooch perforated platinum crucible with prepared asbestos filter, which is dried, previous to use, to a constant weight. After the precipitate has been received upon it and completely washed, it is again dried to constant weight, and the increase of weight calculated as cuprous oxide. We would recommend this modification in case Soldaini's reagent should be used for determining glucose in urine, as the reduction of the cuprous oxide in a current of hydrogen, recommended in the succeeding, is probably inconvenient to the average analyst of urine. Or the end of the reaction may be determined by acidulating a few drops with acetic acid and testing with ferrocyanide of potassium.—ED. AM. DR.]

Rosenbaender and Schiller (*Zeitschrift des Vereins für Rübenzucker-Industrie*, 1887, p. 138) have determined the following quantitative process with this liquid: 100 to 150 C.c. of Soldaini's solution are placed in an Erlenmeyer flask and heated for five minutes over a gas jet. A solution containing 10 Gm. of sugar (clarified with subacetate of lead if necessary) is added, and heated again for five minutes, always over a direct flame. This precipitates all the copper. Next are added 100 C.c. of distilled water, in order to cool the mass very quickly. The turbid liquid is filtered (preferably through a Soxhlet or Herzfeld filter) and washed with distilled water. This oxide of copper is reduced in a current of hydrogen and the copper is weighed in a metallic form, and this weight multiplied by 0.3546 gives the weight of invert sugar. By this method 0.01 per cent of invert sugar can be accurately determined.

Sidersky has recently offered a new volumetric method, based upon the use of Soldaini's solution. With sugars the same method as is now in use with Fehling's solution can easily be followed, watching the disappearance of the

blue color, and testing the end with ferrocyanide of potassium and acetic acid. This process offers no serious objections common to Fehling's solution, but is inapplicable to colored sugar solutions, such as molasses, etc. For the last the following is recommended: 25 Gm. of molasses are dissolved in 100 C.c. of water and subacetate of lead added in sufficient quantities to precipitate the impurities, the volume raised to 200 C.c., and filtered. To 100 C.c. of the filtrate are added 25 C.c. of concentrated solution of carbonate of sodium, agitated, and filtered again. 100 C.c. of the second filtrate, with excess of lead removed, is taken for analysis. On the other hand, 100 C.c. of Soldaini's solution are put into a flask of Bohemian glass and heated five minutes over an open flame. The sugar solution is now added little by little, and the heating continued for five minutes. Finally, the heat is withdrawn, and the liquid cooled by pouring in 100 C.c. of cold water. It is next filtered through a Swedish filter, washed with hot water, letting each washing run off before another addition. Three or four washings will generally remove completely the alkaline reaction. The precipitate is then washed through a hole in the filter into a flask, removing the last trace of copper. 25 C.c. of normal sulphuric acid are added with two or three crystals of chlorate of potassium, and the whole gently heated to dissolve completely the oxide of copper, which is transformed into copper sulphate, according to equation:



The excess of sulphuric acid is determined by a standard ammonia solution (semi-normal), of which the best indicator is the sulphate of copper itself. When the deep blue color gives place to a greenish tinge, the titration is completed. The method of titration is performed as follows: Having cooled the contents of the flask, a quantity of ammonia equivalent to 25 C.c. of normal sulphuric acid is added. From a burette graduated into one-tenth C.c., standard sulphuric acid is dropped in drop by drop, agitating after each addition. The blue color disappears with each addition to reappear after shaking. When the last trace of ammonia is saturated, the titration is complete, which is known by a *very feeble greenish tinge*. The number of C.c. is read from the burette, which is equivalent to the copper precipitated. The equivalent of copper is 31.7, and the normal acid equivalent is 0.0317 of copper. Multiplying the copper found by 3,546 we have the invert sugar. A blank titration is needed to accurately determine the slight excess which gives the pale green tinge. This process is to be highly recommended if experiments show it to be as accurate in our hands as it has in France.

The Composition of Creolin.

TH. WEYL has made an investigation of the new antiseptic, creolin, of which there are two brands in the market, and he has reported his results to the German Chemical Society.

We abstract the following from the *Berichte* (1889, No. 1).

Artmann's Creolin appears in form of a dark-brown, oily, syrupy liquid, having a strong but not disagreeable odor. On standing for some time, particularly when cooled with ice, hard, white crystals separate from it. These consist of *naphthalin*. They are sublimable, melt at 79–80° C. and boil at 216–218° C.

This brand of creolin is scarcely soluble in water, but forms an emulsion with it. It is easily soluble in alcohol, chloroform, and in a mixture of equal volumes of alcohol and ether.

In ether it is but little soluble, but this liquid dissolves the naphthalin and other hydrocarbons.

Pearson's Creolin behaves towards water, alcohol, and chloroform like Artmann's, but differs from the latter by being soluble in ether.

Weyl found neither carbolic acid nor nitrobenzol in Artmann's creolin. The nitrobenzol was tested for by attempting to reduce it to aniline. Pearson's product contains only very minute traces of carbolic acid; nitrobenzol was not tested for in this case.

Both products contain those portions of coal-tar which boil between 210 and 380° C., that is, mainly the hydrocarbons and phenols of the heavy oil and of the anthracene oil. The phenols are combined with soda. It is probably through these "phenolates" that the hydrocarbons are kept in solution.

The analysis of both products was carried out in the following manner:

Portions of 10 Gm. each are mixed with 200 C.c. of water, strongly acidulated with diluted sulphuric acid, well agitated, and then extracted with ether in a separating funnel.

The ethereal extract is treated with solution of soda. The separated alkaline solution is again treated several times more with small quantities of ether. The united ethereal extracts, which contain the *hydrocarbons*, are deprived of water by contact with calcium chloride, then filtered, the ether cautiously evaporated, the residue dried

over sulphuric acid for twenty-four hours, and then weighed.

The alkaline solution is now again acidulated and shaken with ether. The ethereal solution (a), containing the *acids*, is first treated with soda solution, the aqueous portion removed, acidulated with sulphuric acid, and shaken with ether. The ethereal solution is deprived of water by chloride of calcium, the ether carefully dissipated, and the residue, after drying over sulphuric acid, weighed.

The ethereal residue left (see above a) from the treatment with soda solution contains the *phenols*. These are determined by dehydrating, carefully dissipating the ether, drying over sulphuric acid and weighing.

The soda in both creolins was determined in the following manner:

Weighed portions (about 3 Gm.) of each were carbonized in a platinum capsule, the residue moistened with sulphuric acid, and the excess driven off by heat, then carbonate of ammonium added, and the mass ignited to a constant weight.

Artmann's creolin yielded an ash containing much iron.

The following are the results of the analysis:

	Artmann.	Pearson (Jeyes).
Hydrocarbons.....	54.9	56.9
Phenols.....	8.4	22.6
Acids ..	1.5	0.4
Sodium.....	0.8	2.4

It will be seen that the two products differ considerably. The proportion of the phenols to the hydrocarbons in Artmann's creolin is as 1 to 25; in Jeyes' (Pearson's) creolin, 1 to 2.5.

Both products, therefore, have, aside of the name, but little in common.

The author adds: "It is self-evident that preparations of different composition must exercise unequal effects upon the organism. Moreover, the difference in the results has been abundantly demonstrated by my experiments, which belong before a medical audience [and which the author promises to publish soon]. The mode of preparing both products is kept secret by the manufacturers. Nevertheless, these products are used medicinally in spite of the fact that their composition (and they are by no means harmless *nostra*) has not been sufficiently determined."

Testing Phenacetin for Antifebrin.

HIRSCHSOHN gives the following method to detect the presence of antifebrin in phenacetin—which seems to be an adulteration repeatedly observed.

On shaking antifebrin with water of about 15° C. and adding to the filtrate an equal volume of bromine water, the liquid loses its color, and there are crystals separated which probably consist of parabrom-acetanilide, C₆H₄Br.NH.CH₃.CO. If phenacetin is treated in this manner, neither disappearance of color nor formation of crystals is observed.

It is this reaction or behavior upon which Hirschsohn bases his method of testing.

Experiments showed that, when phenacetin contains 20 per cent of antifebrin, the color is at once discharged and crystals are formed. If only 10 per cent of antifebrin are present, the color is not discharged at once, but crystals make their appearance. In presence of 5 per cent, the color remains, but crystals form after five minutes.

The reaction may be rendered more delicate by adding only one-half volume of bromine water to one volume of the filtrate.

[Less than 5 per cent of antifebrin will probably escape this test.]—After *Pharm. Zeit. f. Russ.*

Alteration of Morphine.

ON the changes which morphine undergoes, Lama makes the following statements (in *Bull. Acad. roy. de Méd. de Belge*):

1. Solutions of morphine in redistilled water, kept from air and light, keep indefinitely. If cloudiness occurs, this is due to the formation of micro-organisms. A yellow color, acid reaction, and the separation of crystals are caused either by light or by organized ferments. The yellow color is caused by the transformation of morphine into an amorphous substance, which appears to be the morphetin of Marchand. Crystals are produced by the oxidation of morphine to oxymorphine (that is, "oxydimorphine").

The acid reaction is caused by the generation of morphetin, and of the salts of oxydimorphine. In aqueous solutions of salts of morphine no apomorphine is produced.

2. In the circulation, morphine is oxidized to oxydimorphine, and the latter eliminated by the urine. As this oxidation is not always perfect, unchanged morphine is sometimes found in the urine. In cases of poisoning, therefore, oxydimorphine should first be looked for.—*Mag. of Ph.*

Miscellaneous Formulæ.

THE following are taken from the private formula book of an old pharmacist:

Sachet Mixture.

Coriander.....	4 oz.
Orris Root.....	4 "
Rose Leaves.....	4 "
Lavender Flowers.....	2 "
Mace.....	1 "
Cinnamon.....	1 "
Cloves.....	1 "
Calamus.....	4 "
Tincture of Musk.....	80 min.

Commminute the solids, sprinkle over them the tincture and inclose in bags which are to be well sewed.

Dr. Rush's Dentrifice.

Cinchona, powd.....	4 parts.
Charcoal, powd.....	4 "
Myrrh, powd.....	2 "
Bitartrate Potassium.....	1 part.

Woodhouse's Indelible Ink.

Nitrate Silver.....	1 tr. oz.
Infusion of Nutgalls.....	120 min.
Acacia.....	120 gr.
Water.....	8 fl. oz.

Dissolve the nitrate of silver in 4 fl. oz. of water. In the remainder of the water dissolve the acacia and add the infusion. Then mix the two liquids. The infusion of nutgalls is made by pouring 1 oz. of boiling water upon 30 grains of powdered nutgalls.

Lacquer for Brass.

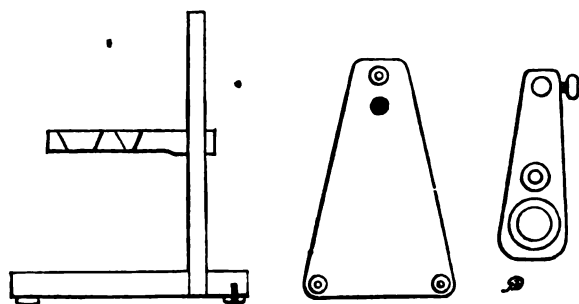
Turmeric, powd.....	1 tr. oz.
Annatto, best.....	1 "
Saffron, Spanish.....	1 "
Shellac.....	8 "
Alcohol.....	16 fl. oz.

Digest the first three ingredients with the alcohol for twenty-four hours, then dissolve the shellac in the liquid.

Cologne.

Oil Bergamot.....	680 min.
" Neroli.....	80 "
" Rose.....	60 "
Musk.....	10 gr.
Tinct. Vanilla.....	120 min.
Extr. Jasmin.....	680 "
" Violet.....	680 "
Deodorized Alcohol.....	7 pints.
Water.....	10 fl. oz.

Mix the oils and extracts with 6½ pints of deodorized alcohol, digest the musk with the remaining half pint at a gentle heat, in a closed bottle, for twenty-four hours, then add to the other liquid, add the water, cool, and filter. If convenient, set aside for some weeks before filtering.



Administration of Sulphonal.—Peter Boa, in a paper recently read on this subject before the Edinburgh Chemists' Assistants' Association, says: It may be worth noting that a little spirit and water seems the best vehicle for sulphonal. Any convenient spirit may be used, such as brandy, whiskey, or tincture of cardamoms. From a teaspoonful to a tablespoonful, according to the size of the dose of sulphonal, should be put into a wineglass, and the dose of sulphonal added. The sulphonal sinks, and when water is added and the mixture stirred, it diffuses beautifully. With water only it persistently floats.

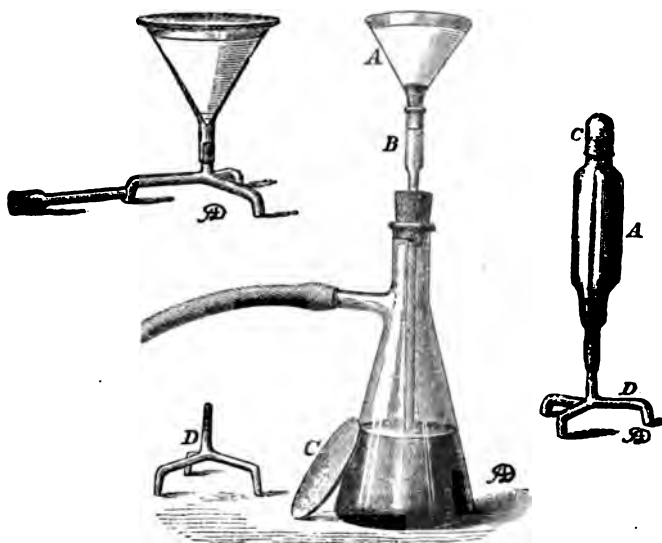
Note on Male Fern.—Dr. de Man publishes, in the *Therapeut. Monatshefte*, some important notes on the use of male fern, confirming the statements made some months ago by Professor Gerhardt. The principal requirement seems to be to give larger doses of the remedy in cases of tape-worm than have hitherto been considered sufficient. In twenty-seven cases which the author records, all succeeded, the extract being taken in some cases in quantities from ½ up to 5 drachms, or even 1 oz., in single doses. Of course, precautions have to be taken, as poisonous symptoms may sometimes supervene.—*Chem. and Drugg.*

APPARATUS FOR WEIGHING UPON TARED FILTERS.

(ONE of the inconveniences of weighing upon tared filters consists in this, that the filter (if a paper one) must be taken out of the funnel, and either put between watch-glasses or into a special weighing bottle, since it is impossible to make correct weighings when the filter is exposed to the air.

The apparatus devised by Prof. de Koninck, of Liege, does away with this drawback. It consists of a very thin and light funnel A, the exit-tube of which, which is thin and short, is ground into the upper part of the tube B. This arrangement permits the funnel being connected with the filter-pump. As soon as the filtration and the washing of the precipitate upon the filter is completed, the funnel with filter is removed to a drying oven, then covered with a glass-plate C and allowed to cool in the exsiccator. Finally it is placed upon the tripod D, whereby the access of air to the neck is at the same time prevented, and the whole weighed.

The same principle may, of course, also be used, when filtering through glass-wool or asbestos. In this case, the filtering media are preferably put into funnel-tubes which may be closed with a ground cap.—After *Zeitsch. f. angew. Chem.*, 1888, 689.



IMPROVED FILTER-STAND.

THE following paper by D. E. Dott was recently read before the Society of Chemical Industry, at Edinburgh:

While great improvements have been effected on the finer kinds of laboratory apparatus within the past few years, and instruments of precision have been carried to great perfection, the simpler yet essential appliances have been rather neglected. Among these latter may be counted filter-stands. As ordinarily constructed, they have three principal defects. Firstly, they are made to stand on a flat wooden base, or, what amounts to the same thing, they are made to stand on their feet; whence it results, either from an original defect in the workmanship or, more often, from the wood having warped, that the apparatus stands unsteadily. With such a filter-stand one frequently finds that just as the filter is being filled, on account of the alteration in the centre of gravity of the system, there is a sudden jerk, by which some of the liquid is thrown up on the sides of the funnel; and generally there are all the inconveniences of a shaky piece of apparatus. Secondly, the opening in the arm for the support of the funnel is always either too large for small funnels or too small for large funnels. Thirdly, the openings are rarely made at the proper angle of 60°, but are more often simply cut straight through, with perpendicular sides, the result being that the funnel has a tendency to fall to one side.

The filter-stand illustrated has been devised to remedy these defects. As is done with optical instruments, it is made to stand on three feet to insure steadiness. Stability can never be relied on in a four-footed instrument, as even although it is truly made, the least irregularity of the table will render it unsteady. The arm has been pierced with two holes, so as to make it suitable for both large and small funnels, and the bevelling of the holes has been done as nearly as possible at the correct angle. Filter-stands should never be varnished. The tendency of varnish is to cause the movable parts to become fixed, and it is besides acted upon by many of the solutions in constant use. The best plan is to rub over all wooden apparatus with a little boiled linseed oil, which sufficiently preserves the wood, and renders it non-absorbent.

Bouchardat's Gout Pills.—Compound extract of colocynth, 20 parts; extract of colchicum, 20 parts; extract of opium, 1 part. Make into pills weighing 15 centigrammes [2½ grains] each.

The True Color of Bodies.

THE true color of bodies, M. Govi thinks, is in many cases unknown to us. In a communication read, on October 11th, before the Academy of Sciences, he attributed our ignorance to the imperfect nature of sunlight, which lacks several colors—that of the sodium rays, for instance, being absent from the solar atmosphere. When biniodide of mercury or minium is viewed under sodium light, both still appear of a bright yellow hue, while under the ordinary orange portion of the spectrum they are quite black. Biniodide of mercury and vermilion, both sensibly alike in sunlight, are, in sodium light, the first bright yellow and the second dark brown. In the same manner M. Govi thought bodies now considered black would prove to have a color of their own could they be viewed under a proper light; and it is only when we have a complete light, representing the whole spectrum, that we shall be able to really know the true color of bodies. The foregoing is a brief outline of the paper read before the meeting, but it is to be published in full in the *Comptes Rendus*, and will no doubt prove of no little scientific interest.—*Chem. and Drugg.*

Assay of Chloral-Hydrocyanate.

CHLORAL-HYDROCYANATE has been recommended some time ago as a substitute for hydrocyanic acid or cyanides in medicine, as it is of constant composition, perfectly stable and manageable, and readily assayed. In our judgment, this substance really deserves the attention of the medical profession, and ought to find speedy introduction.

There is at present an argument being carried on between several authorities, on the best method of assaying the compound.

Utscher recommended methods involving the use of a silver salt and of iodine, but Scharges found that by these methods he obtained results ten per cent lower than could be obtained by converting into sulpho-cyanide of copper. The latter author also found that when chloral hydrocyanate is heated with caustic alkali and alcohol, *isonitrile* is formed, which is easily recognized by its penetrating, characteristic odor. Besides, some ethylamine is also produced as an intermediary product, and further on carbylamine. Moreover, the author points out that the cyanide of potassium which is formed from the chloral hydrocyanate by the reaction with the caustic alkali is partly decomposed into formate of potassium and ammonia, when its aqueous or alcoholic solution is warmed. Hence, a portion of the cyanogen is destroyed, and escapes the assay with silver salt and iodine. For this reason the author prefers the estimation of the cyanogen as sulpho-cyanide of copper.

Chloral-hydrocyanate is otherwise known as the nitrile of trichloroacetic acid: $\text{CCl}_3\text{CH}(\text{OH})\text{CN}$. Every 100 parts of it correspond to 15.5 parts of anhydrous hydrocyanic acid. The substance is very soluble in water, alcohol, and ether, and it is very stable, both in the dry form and in solution. While passing through the body it is decomposed, exerting the full physiological effects of the proportion of hydrocyanic acid contained therein. If it is desired to prepare a solution corresponding in strength to the officinal hydrocyanic acid (of 2 per cent HCN), 12.9 parts of chloral hydrocyanate are dissolved in enough distilled water to make 100 parts. A "bitter-almond water," equivalent to that of the German Pharmacopoeia, may be prepared by dissolving 6.5 parts of the salt in enough distilled water to make 1,000 parts.

Systematic Examination of Sulphate and Hydrochlorate of Quinine.

THE examination of these quinine salts has caused quite a number of processes to be devised, but not one of these can be relied upon in furnishing a positive answer regarding the purity of these salts. To frame a method which allowed the presence or absence of the more frequently occurring impurities, such as quinidine, cinchonine, and cinchonidine, to be proven in a simple and comparatively rapid manner, the majority of the published processes were carried out and their merits and defects ascertained; as the result, the following compilation has been found to work successfully.

A. For Sulphate.

1 Gm. with 15 C.c.

For Hydrochlorate.

1 Gm. and a solution of 0.4 Gm. sodium sulphate in 1 C.c. water, with 80 C.c.

of distilled water are agitated for five minutes, and filtered. To the filtrate is added 0.5 Gm. Rochelle salt, agitated for five minutes, allowed to stand five minutes and filtered; the precipitate of tartrates is collected on a small filter and reserved, the filtrate for the

B. Detection of quinidine and cinchonine is divided into two portions, one of which is reserved; to the other add one drop of water of ammonia, and allow to stand for a few moments.

1. The solution remains clear; absence of quinidine and cinchonine; proceed E.

2. The solution becomes turbid; presence of quinidine and cinchonine, or both; proceed C.

C. Detection of Quinidine. To the reserved portion (see B), add 0.5 Gm. KI, shake for five minutes, allow to stand for same time. Result:

1. The solution remains clear, if quinidine is absent; proceed D.

2. The solution becomes turbid or deposits resinous precipitate. In this case cinchonine must first be tested for, according to D, and then

a. In absence of cinchonine, the turbidity with KI indicates the presence of quinidine; proceed E.

b. In presence of cinchonine, the ammoniacal solution in B is filtered, the precipitate washed with distilled water and the thalleioquin reaction* carried out with the precipitate. If the intense green color is produced, there is quinidine present; if the green color is not produced, quinidine is absent. Proceed E.

D. Detection of Cinchonine. The liquid after addition of KI is filtered, and one drop water of ammonia added; set aside for a few minutes; there results:

1. Perfectly clear solution, in absence of cinchonine. Proceed E.

2. Turbid solution, if cinchonine is present. Proceed E.

E. Detection of Cinchonidine. If in the foregoing examination cinchonine or quinidine is found, the precipitate of tartrates (see A) is carefully washed with 15 to 20 C.c. Rochelle salt solution (1 to 20); were these alkaloids not found this washing is superfluous. The precipitate is dissolved off the filter by use of 3 C.c. dilute H_2SO_4 (1 to 20); to the solution, 2 C.c. ether and 1 C.c. water of ammonia are added; the mixture is well shaken for one minute and allowed to stand at rest five minutes. This shaking and allowing to stand is repeated several times (the time allowed not to exceed a half-hour). Notice:

1. The ethereal layer and the sides of the test tube remain perfectly clear in absence of cinchonidine.

2. The ethereal layer and the sides of the test tube become cloudy, if cinchonidine is present.

Remarks referring to Quinine containing Quinidine. By this method one-fourth or one-half per cent quinidine cannot be detected. Often 1 or 2 per cent quinidine will give no reaction with KI, but its presence can be ascertained by the addition of water of ammonia, which is a more delicate test. In the examination of quinine with 10 per cent quinidine nothing extraordinary is noticed, but in presence of 15 per cent and more of this alkaloid it is noticed on addition of Rochelle salt that the tartrates are not precipitated; this does not, however, interfere with the further detection of quinidine. Should more than 15 per cent quinidine be suspected, more KI must be used, otherwise it must be feared that the quinidine is not thoroughly precipitated and, later, may be mistaken for cinchonine. As a large percentage of quinidine prevents the separation of the tartrates and, as was found by special experiments, quinine sulphate mixed with quinidine sulphate is more difficultly soluble than the pure salt, there appears to exist a dependency between the two alkaloids.

Remarks referring to Quinine containing Cinchonidine. One-half per cent of cinchonidine is easily detected within half an hour. Should the per cent of cinchonidine be so minute that a precipitate cannot be clearly distinguished, absence of the alkaloid must be decided, as the reaction is so characteristic that there can absolutely be no mistake. With 1 per cent the reaction is more decided; with 2 per cent there appears a deposit in the ether. Cinchonidine is recognized by the capillary rising of the precipitate beyond the ethereal layer, immediately after shaking the solution. Care must be exercised that not every slight turbidity at the line of contact of the two liquids be pronounced as cinchonidine, only in case the precipitate is capillary attracted by the side of the test tube can there be no doubt regarding its presence. If the quinine contains 10 per cent cinchonidine, there appears at the line of contact of the two liquids a white cretaceous ring. Cinchonidine, in the absence of quinine, is separated as a white precipitate in the ethereal layer.

Remarks referring to Quinine containing Cinchonine. One per cent cinchonine is easily recognized; the more cinchonine present in the quinine the greater the precipitate with water of ammonia. When more than 5 per cent cinchonine is present, there forms on addition of KI a turbidity of cinchonine hydriodate which can easily be mistaken for separated quinidine; 10 per cent causes a precipitate of a tenacious character similar to quinidine hydriodate.—C. HIEBIG in *Pharm. Zeitsch. f. Russl.*; after *The Analyst*.

Alstonia Constricta in place of Hops.—Merck states that there is much demand for the bark of *Alstonia constricta* for use in foreign breweries, where it is used as a substitute for hop bitter in the preparation of pale ale for export. It is said to produce neither headache nor the other unpleasant symptoms caused by the hop bitter.

* Excess of chlorine water prevents the thalleioquin reaction, while excess of ammonia favors it.

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FREDERICK A. CASTLE, M.D. EDITOR.

CHARLES RICE, Ph.D. ASSOCIATE EDITOR.

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EDITORIAL.

WE are frequently requested by correspondents to indicate to them some special source of information on some particular subject, as for instance, when some one desires to learn all about the chemistry, properties, and uses of nigrosine, or the manufacture of yeast, or certain kinds of essential oils, and an endless variety of other subjects. In giving the desired information, we always aim at mentioning those works which, in our judgment, give the fullest and most recent account of the subject. It happens sometimes that our correspondents send back word that the books we have mentioned are of no use to them, as they cannot read them, being in foreign languages, and they ask us to name others, printed in English. Now, regarding this, we would like to say that we always prefer to give to our inquirers, *first*, the titles of English printed works, provided there are any known to us which just cover the subject inquired about. It is not always possible to find equally good works, in different languages, treating of the same subject. If any one really wants reliable information, he should not go to second or third class authorities, but only to those of the first class. And if the latter happen to be written in a foreign language, the inquirer should assume the task of finding some one who, either as a favor or for money, shall translate for him such passages as may be required. There are many subjects on which, just at this moment, there are more exhaustive works in English than in other languages (as for instance, on the manufacture of steel, on mineralogy, etc). Again, there are subjects on which the best works are in German. Indeed, there are many in this language which are indispensable as works of reference, and which scientific workers cannot afford to do without (for instance, Beilstein's "Handbuch d. Organischen Chemie," Kick u. Gintl, "Technologisches Lexikon," etc., etc.). And so it is with French literature and others. We would not deem our advice as being of any benefit, if we were to restrict ourselves always to English works. Sometimes we hear the remark made: "What is the use of putting foreign works in one's library? The English literature is surely of rapid enough growth and large enough to absorb and comprise all that may have been published in other languages, and is worth preserving." This is true only to a certain extent. That the facts of science and the results of historical research obtained in other countries

will be incorporated into English literature is just as sure as that new facts and results first made known in English will eventually be published in other literatures. But neither is this reciprocal process always very rapid, nor are the depositories of the matter always very accessible or convenient. If one work can be pointed out in any one language which comprises *all* that is known on a subject, so far as a particular inquirer needs it, *that* is the work for him to consult. He may possibly find the whole of the same information in works of another language, but he may be compelled to pick it together from a dozen or more volumes. The principle which guides us in this matter is the same which should be kept in view when collecting a reference library for one's personal use, viz., "Always get the most comprehensive, best, and most recent work on any subject, even though it be printed in a foreign language. Of course, *some* discretion as to foreign languages *must* be exercised. But so far as German, French, Italian, and Spanish is concerned, there will probably be little difficulty in obtaining help to read works printed in these languages.

It has often seemed to us desirable for the interests of the pharmacists of this locality that there should be more general agreement with regard to the prices which may be charged with propriety for prescriptions. Every one agrees that a higher remuneration is proper for this class of product than for the mere sale of commodities which involve less responsibility, time, proficiency, and expense, and we think it will be readily granted, also, that the location of the store should have some influence, since the elements of rent and maintenance vary greatly between an establishment in a fashionable or choice business neighborhood and one located in the midst of less expensive surroundings. That such considerations do not always influence the dispenser, and that there is practically no uniformity in the basis for a charge, is unquestionably the case in many instances; and as an illustration we will mention one which lately came to our attention. A prescription for four ounces of Dobell's solution cost at one store 60 cents, it was refilled at another for 30 cents, and at still another at 15 cents. It can hardly be expected that the person who paid these varying prices should fail to consider that the first two were instances of egregious overcharging, since the one who charged but 15 cents was not likely to dispense a prescription for less than its value.

We will not undertake to say which of these three charges was the more nearly correct, but we will add that all three of the stores were in first-class neighborhoods; that the rental paid by the first two cannot be very different, and that the third was not known as a "cutter."

The point we wish to make is the desirability of securing greater uniformity upon *some* basis; since a disparity like the one we have mentioned is a source of injury to the entire profession.

A New Element Combined with Nickel and Cobalt.

SOME time ago, the cable announced that Dr. Krüss, of Munich, had succeeded in decomposing nickel and cobalt. The first authentic reports of the discovery have since then reached us, and from these we learn that nickel and cobalt still exist as elements, but that both metals have been found to be accompanied by a probably *new* element which has heretofore been entirely overlooked. Dr. Krüss made the discovery in conjunction with F. W. Schmidt, and the first report is contained in the *Berichte* (1889, 11), from which we abstract the essential parts.

The atomic weight of gold having not long ago been re-determined by Dr. Krüss with the utmost care, it was proposed to re-determine those of nickel and cobalt by means of a gold-salt. Without entering into minute details, it suffices to state that it was attempted to precipitate metallic gold from a neutral solution of the chloride by either a nickel or a cobalt salt. If this reduction took place quantitatively, one method of settling the atomic weights of the latter would be at hand. It was, however, found that there was always a loss which could not be accounted for by charging it to analytical errors.

After a solution of gold chloride had been reduced as far as possible by cobalt, the remainder of the solution

was treated with sulphurous acid to throw down the remainder of the gold. The latter was then washed, the first portion of the wash-water, containing chloride of cobalt, having a red color. This soon faded and passed over into a faint green tint. This portion was collected separately, evaporated, and ignited, when a small residue was left which dissolved in warm, concentrated hydrochloric acid with a fine green color. On cooling the liquid became almost colorless.

With nickel in place of cobalt, similar results were obtained.

In order to obtain larger quantities of the unknown substance, various experiments were made, and enough was finally obtained to serve for preliminary trials.

The authors are extremely reserved in their statements concerning the supposed new substance, as they do not wish to announce anything which has not yet been absolutely demonstrated, but they expect to be able in a short time to make a definite report.

Meanwhile they give an account of the peculiar properties of the substance, so far as reagents, etc., have permitted conclusions:

An acid solution of the chloride is not precipitated by hydrosulphuric acid; but a neutral solution, treated with sulphide of ammonium, throws down a blackish sulphide. Ammonia throws down from the chloride solution very voluminous white flakes, which resemble hydrated zinc or aluminum oxides. An excess of ammonia does not redissolve the precipitate.

Solution of potassa likewise precipitates a snow-white hydroxide, not soluble even in a large excess of the precipitant. This shows it is distinct from alumina. The strongly acid chloride solution possesses the peculiar greenish-yellow tint which first drew the attention of the observers to it. When perfectly dry and free from acid, the chloride is white and yields a colorless solution with water. If vapors of hydrochloric acid are allowed to come in contact with the white chloride, it again assumes a greenish tint and yields a tinted solution with water.

The metal (element) was obtained from the chloride both by electrolysis and by reduction with hydrogen. It had a black color; in thin sheet, brownish-black, and is easily soluble in acids, if separated in the cold by electrolysis; much more difficultly, however, if reduced, in a current of hydrogen, at a red or white heat.

New "Cocaines."

As already announced in a previous issue, Alfred Einhorn has succeeded not only in making cocaine, the alkaloid of coca leaves, artificially from benzoyl-ecgonine, by introducing into it the methyl group, but he has also found that a whole series of other "cocaines" may be obtained by causing other groups to enter instead of the methyl group. In a recent paper (*Ber. d. Deutsch. Chem. Ges.*), he announces and describes three such compounds, one of which is the lower homologue of true cocaine, while the others are metameric or higher homologues. Two of these could not be obtained in a crystalline form, but only in form of oil. The third, however, as well as the salts of all three, are crystallizable. Whether any of these new "cocaines" possess special therapeutic properties has not yet been ascertained, or at least not been announced. It is not improbable that some of them will be found serviceable.

Artificial Sugar.

THE problem of producing cane sugar synthetically, though still far removed from the point when it can be used practically, has been brought another step nearer solution by the continued researches of Emil Fischer, in conjunction with Julius Tafel. In a recent paper, published in the *Berichte* (1889, 97) they give the results of their researches, the most remarkable of which is, that they have succeeded, for the first time, in producing a sugar which can be fermented by yeast, like the natural sugars. The only difference from the latter is this, that the artificial sugar is optically inactive, but the discoverers hope to obtain optically active sugars by means of fermentation. The new sugar has, provisionally, been called *acrose*. The starting point is glycerin, from which, by way of its decomposition product, *acrolein*, two new kinds

of sugar: $C_6H_{12}O_6$ had already some time ago been prepared by the authors, by means of treatment with baryta or alkalis. One of these sugars had been designated *alpha-acrosazon*. It has now been found that this latter may be partly converted, by means of hydrochloric acid, into a new substance, resembling glucoson, which the authors term *alpha-acrososon*. When this is treated, in a dilute aqueous solution, with zinc-dust and acetic acid, it is completely reduced inside of one hour. The mixture is then treated with hydrosulphuric acid, the precipitate filtered off and the filtrate evaporated in a vacuum. The residue is dissolved in absolute alcohol, the solution filtered, and the filtrate, after being highly concentrated, mixed with much ether. This precipitates the new sugar, *acrose*, in colorless flakes, which soon change to a syrup, and has the greatest resemblance to natural sugars, having a sweet taste, reducing Fehling's solution, and responding to other tests characteristic of sugars.

Permanent Caffeine Salts.

MERCK some time ago announced that he has succeeded in producing true salts of caffeine with citric, cinchonic, and hydriodic acids, which did not decompose or split up when coming in contact with water. It will be remembered that Prof. J. U. Lloyd (see *NEW REM.*, 1881, 38) succeeded in preparing crystallized caffeine citrate, but this salt did not bear solution in water without decomposition. In what manner Merck succeeded in producing a permanent salt is not stated. But the citrate, as now available, is stated to be soluble in 30 parts of water at $42^{\circ} C$.

MR. H. V. DAKERS, of 45 Liberty street, New York, agent for the sale of the "Art of Dispensing" noticed in our December number, calls our attention to an error on our part in stating the price to be \$1. The correct price is \$1 25.

College of Pharmacy of the City of New York.—The present session, which is materially longer than any of its predecessors, is believed to have been the most successful, in results of teaching, which the college ever passed through. The number of members of the senior class is 131, and that of the junior class 159. The new method of instruction adopted by Prof. Elliot in the chemical and pharmaceutical laboratories has proved a decided success, and has resulted in a much better practical training of the students. The department of pharmacognosy has gradually been expanded so as to cover a larger ground than in former years, and the instruction bestowed in this discipline is thoroughly appreciated by the students, who thus obtain a sound and firm foundation for the diagnosis of commercial drugs.

Various improvements have been planned for the next winter session (1889-1890). In this connection it may be announced that, owing to the resignation of the present professor of botany and materia medica, Dr. Walter De F. Day, the college has selected, as his successor (after the close of the present winter session), Dr. H. H. Rusby, who is well known as an expert botanist, and who has made extensive travels on this Continent, both north and south of the equator, in pursuit of knowledge referring to the branches of science he will be called upon to teach.

The Commencement Exercises will be held on Tuesday, April 16th, at Steinway Hall, at 7:30 p.m.

The Rhode Island Pharmaceutical Association, at its fifteenth annual meeting, held in Providence on the 9th of January, elected the following: President, F. A. Jackson, Woonsocket; Vice-President, J. T. Wright, Newport; Secretary, W. E. Cotes, Providence; Treasurer, A. W. Feemer, Jr., Providence; Executive Committee, J. H. Taylor, Newport; N. N. Mason and J. O'Hare, Providence. The Treasurer reported a balance of \$112.72.

The New Haven (Conn.) Pharmaceutical Association have elected at the annual meeting, January 15th: President, N. J. Beers; Vice-President, C. Fleischner; Secretary, H. I. Sperry.

The Moffitt-West Drug Company, composed of a number of gentlemen of whom the most were in the employ of the Richardson Drug Company, is to succeed the latter company, whose establishment was burned in January.

The South Dakota Board of Pharmacy will meet at Flandreau, Dakota, on March 12th, 1889, for the examination of candidates for registration. Application may be made to the secretary, B. F. Stearns, at his office in Aberdeen, Dakota, who will furnish blanks on request.

A College of Pharmacy has been organized under the auspices of Willamette University, at Portland, Oregon. The professor of pharmacy is John M. A. Laue, of the class of '81 of the College of Pharmacy of the City of New York, and the class numbers 20 students.—*Western Druggist*.

CORRESPONDENCE.

An American Odoriferous Insect.

EDITORS OF THE AMERICAN DRUGGIST:

I NOTICED on page 217 of your last November number an article entitled: "A Perfumed Insect." In this connection I desire to call attention to the fact that in this country we have an insect which is probably well known to entomologists, and which is also a "perfumed insect." This insect is familiar to persons whose occupations bring them about the rivers and streams of this section of the country, and probably is common elsewhere. Its common name is "write my name," so called from the curious manner in which it runs or swims about the surface of the water with great rapidity, especially when disturbed. I do not know its proper systematic name. It is of a dark-brown color, and occurs in little schools along the edges of our streams where the current is not swift. These insects, when disturbed, exhale, while young, a fruit-like fragrance, which is likened by some persons to the odor of early harvest apples, and it is quite pleasant. If they are caught and held in the hand, they impart this odor to the latter, and it seems as though the irritation excites them to emit it. When they are old, or at least very large, they exhale a much stronger, indeed an unpleasant, odor.

By the way, throughout the South and this section of the country we have what is known in popular language as the "tumble bug," which insect invariably excites much attention from Northern people (the insect is rare or unknown in the North), owing to the manner in which it rolls (tumbles) balls of food about half an inch in diameter with its hind legs to the spot where it digs a deep hole in the ground, and probably deposits its eggs inside the ball. These insects also, when excited, exhale an odor, but it is intensely offensive, as is soon discovered by persons who anger them.

J. U. LLOYD.

CINCINNATI, OHIO, February, 1889.

[The "tumble bug," or "tumble dung," is the name given to several beetles of the family of Scarabæidæ, but especially to *Coprobius volvens*. The ball which it rolls contains its eggs, and is composed of dung, the fermentation of which develops the heat required to hatch the eggs. This variety of beetle is found as far north as New York State.

At our solicitation, Mr. William Congdon Wood, of New York, has furnished us with the following notes on this subject, which will, we think, prove of interest.—ED. AMERICAN DRUGGIST.]

Some Odoriferous Insects.

FEW persons who are accustomed at all to observe natural objects can have failed to notice that many insects are perfumed, or odoriferous. The latter word is, perhaps, the more applicable, since the odor of many insects is anything but perfume.

In the case of such as live in waste and decaying animal matter the odor is the result of their food and surroundings, but with many insects there is no such cause for it, and we must suppose that they have been endowed with a special perfume for some useful or necessary purpose. Thus we find many insects which are, apparently, protected from their enemies by their pungent or fetid odor. A small blue and yellow beetle (*Brachinus fumans*) is accustomed, when disturbed, to discharge from its anal opening a cloud of bluish vapor, accompanied by a sharp report, from which it has been popularly named the Bombardier. This vapor, which is a liquid volatilized by contact with the atmosphere, has a suffocating smell, and burns the fingers quite severely if the insect is picked up. The large green beetle (*Calosoma scrutator*) which is often to be seen running over sunny places, has a very peculiar fetid odor, as have almost all the other members of that family (Carabidæ).

With some insects their perfume seems to be useful as a sexual attraction. As an instance of this may be mentioned the case of a large black wood-boring beetle (*Prionus laticollis*) which possesses a powerful odor very nearly resembling that of musk. The females are more noticeable in this respect than the males, their perfume being so strong as easily to be perceived by a person when several yards distant. The pretty yellow and black striped beetle (*Cyllene robiniae*), whose grub is so destructive to our locust trees, has a very strong and peculiar odor, which scarcely resembles any other, unless it be that of phosphorus. The beetles feed in numbers on the Golden-rod (*Solidago*) in September, and very much resemble the striped hornets which are also found there frequently.

The odor of many insects closely mimics that of various vegetable substances. Thus the common brown wasp resembles in smell the vanilla and tonka beans, as do also several species of the brightly-colored tiger beetles (*Cicindela*), which run and fly along sunny roads and shores. A large shining bronze beetle (*Osmoderma eremita*), often found in old orchards, has the perfume of a ripe peach, and a little blue and green ground beetle (*Chlaenius nemoralis*) that of the butternut. The blackish "squash-bug" (*Coreus tristis*) has an odor somewhat resembling

that of the pine-apple. This insect, when disturbed, has a curious way of tilting itself to one side and throwing out a fine spray of volatile, and probably irritating, liquid from pores along its abdomen. It is sufficient, in closing, to mention one more bug, the *Cimex lectularius*, which, although best known for its blood-loving propensities, has also a peculiar and distinctive odor. W. C. WOOD.

New York, February, 1889.

The San Francisco Meeting of the A. P. A.

EDITOR AMERICAN DRUGGIST.

DEAR SIR:—To publicly reply to many inquiries concerning the time required and the minimum total cost of the trip to San Francisco and return, I respectfully request that you will give some information on this subject in the next issue of your journal.

As to the time, I may say that twenty-one days will suffice from the farthest point East, and proportionately less according to the locality. It is contemplated by many, however, to stop over a day or more en route.

Monday, June 17th, has been fixed upon by the committee on arrangements for those visiting members of the A. P. A. to be in Denver who desire to avail themselves of the proffered hospitalities of the Denver Phar. Ass'n.

Those who do not wish to stop over on the way need not leave their homes on the Eastern seaboard until this date, or even a day later in some localities, in order to reach San Francisco in time for the opening session of the annual meeting, June 24th. At the present excursion rate, the necessary total cost of the trip, from Boston say, need not exceed \$210, travelling first-class in every particular, with meals, sleeping cars, hotel in San Francisco during the meeting, etc.

This estimate is based upon the present rate—fare, \$135, and for Pullman sleepers, \$43, round trip, with meals, hotel, and other contingent expenses. We confidently anticipate, however, that a further reduction from this fare will be made for us by the trunk lines which will reduce the cost at least \$15. It is also arranged that passengers can go by one route and return by another, as they may individually elect. For the Eastern contingent it is proposed to go by way of the Chicago, Denver, then by the "Scenic Route of the World" (the D. & R. G.) to Salt Lake, and the Central Pacific to San Francisco, returning by the Northern Route, which will cost \$15 additional, the fare from San Francisco to Portland; or, if preferred, any other transcontinental lines can be selected without additional cost. A full "itinerary" is now in preparation which will be ready in the course of a week or ten days.

The Western members have also arranged for a special excursion from St. Louis over the Union and Central Pacific which is open to every one to join. The cost of this is \$150 from St. Louis, with all expenses paid outward and railroad fare paid back to starting point.

Arrangement is also in progress for a special excursion from Chicago by which the trip can be made at considerably less cost than any other, inasmuch as sleeping cars will be provided by the railroad company at a nominal price, if not entirely free of cost.

EMLEN PAINTER,

Chairman Com. on Arrangements,
Broadway and 34th St., New York.

Erythrine is an alkaloid derived from a Mexican plant, *Erythrina coralloides*, or colorin, as it is there called. Dr. Fernando Altamirando, the discoverer of the active principle, calls it "erythrine." It is a white, spongy, greasy solid, crystallizing in various forms, melting at a low temperature, and forming a dark yellow liquid with disagreeable and characteristic odor. It is soluble in water, ether, and benzol, still better in chloroform, and very freely in alcohol. From an alcoholic solution it is precipitated by alkalies, especially by ammonia, as an amorphous substance resembling resin. Concentrated nitric acid dissolves it, rendering it slightly yellow. It is precipitated by bichloride of mercury, double iodide of bismuth and potassium, bichloride of platinum, and by bichromate of potassium. It contains nitrogen. It has great power in counteracting strychnine poisoning, and can be borne by the human subject, without danger, in doses in 0.6 gramme.—*Pharm. Journ.*

Batjitjor Root has recently been recognized as the root of *Vernonia nigritiana*, a composite growing in Senegambia to the height of a foot or more. Dorrault alludes to it as a substitute for ipecacuanha, to which it has a faint, external resemblance. Heckel and Schlagdenhauffen have obtained from it a whitish, slightly hygroscopic glucoside, which they call vernonia, and which has the formula C₁₂H₂₂O₁₁. Its action resembles that of digitalis, but it is estimated to be twenty-four times weaker than the soluble principle of digitalis (digitalein).—*Pharm. Jour.*

Members of the Louisiana State Board of Pharmacy.—Jos. T. Thibodeaux, Thibodaux, La., President; Wm. Graner, New Orleans, La.; Alex. K. Finlay, New Orleans, La.; F. M. Brooks, Baton Rouge, La.; R. L. Iler, Shreveport, La.; James A. Lee, New Iberia, La.; Oscar Robin, New Orleans, La.; R. N. Girling, New Orleans, La.; F. C. Godbold, New Orleans, La., Secretary.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,286.—Bleaching and Polishing Sole Leather, (Haverhill, Mass.).

This correspondent wishes a receipt for bleaching sole-leather and polishing it so as to leave it of a glossy, creamy-white color. Our experience in this direction is very limited, but we are informed that leather may be bleached by means of oxalic acid and polished by friction. In the preparation of pale leather the bleaching is commonly done before finishing, and the machinery used for polishing the face of finished hide is of such powerful construction as to admit of the use of great pressure with a roller. This roller is passed back and forth across the surface until it has been brought to the requisite degree of hardness and polish.

No. 2,287.—Sponge Tents (J. E. L.).

We are not aware that any sponge tents are made in this country, the cost of labor here making it cheaper to import them. The method of making them consists in selecting pieces of sponge which are not too fine and soft, as these are not sufficiently elastic, and not too coarse, since they would not dilate evenly. After thorough cleansing, the pieces are transfixed lengthwise upon stout wire and moistened with mucilage of gum-arabic. They are then wrapped very tightly with strong cord and dried thoroughly. The cord is then removed and the proper shape given to the tents with the aid of a sharp knife and sand-paper. After removing the wire a hole is made through the thick end by means of an awl, and a loop of cord threaded through it. Dr. J. C. Nott suggested that each tent should be wrapped in gold-beater's skin which should be punctured in several places to admit fluids; the gold-beater's skin serving to prevent fragments of the sponge becoming entangled in the openings of the mucous glands and folds in the canal of the uterus.

No. 2,288.—Bright-red Ink (M. F. N., Kansas).

This subscriber wants a receipt for a bright-red ink not made with carmine. Here is a very good one:

Eosin (A, yellowish) $\frac{1}{2}$ oz.
Glycerin 8 fl. oz.
Water24 "
Alcohol enough to make 32 "

Dissolve the eosin in the water (hot), and add the glycerin. Allow to cool, then add enough alcohol to make 32 fl. oz.

This ink will stand considerable dilution. Even when mixed with an equal volume of water, it will be quite brilliant yet.

Eosin is an aniline color, being chemically tribromofluoresceine. There are a variety of shades of it, from decided yellowish-red to scarlet-violet. In purchasing, it is best to specify "Eosin A, yellowish, for red ink."

The addition of 1 grain of gelatin (dissolved in some of the water) and $\frac{1}{2}$ grain of bichromate of potassium to every ounce of the ink will make it dry more quickly on paper.

No. 2,289.—Works on Perfumery (W. B. S.).

There are many works on this subject. The most useful for general purposes are the following: The "Art of Perfumery," by G. W. S. Piesse, 8vo, London. "A Comprehensive Treatise on Perfumery," by R. S. Cristiani, 8vo, Philadelphia and London. "Die Riechstoffe," von Dr. St. Mierzinski, 8vo, Weimar. "Toiletten Chemie," von Heinrich Hirzel, 12mo, Leipzig. "Guide pratique du Parfumeur," par Dr. A. B. Lunel, 12mo, Paris. "Die Parfumerie Fabrikation," von George William Askinson, 12mo, Wien (Hartleben), and others.

The prices of these works may be learned by writing to some book importer; for instance, J. H. Vail & Co., 21 Astor place, N. Y.

No. 2,290.—Jayne's Expectorant (J. W. W. and B. S.).

The following formula is stated by Kilner to produce a mixture very much resembling this preparation:

Tincture of Tolu $\frac{1}{2}$ fl. oz.
" " Camphor 1 fl. dr.
" " Lobelia 1 "
" " Digitalis 1 "
" " Opium 2 "
Syrup of Squill 3 fl. oz.
Ipecac, powd. 4 gr.
Tartrate of Antim. and Pot. 4 "

Dissolve the Tartrate of Antimony and Potassium in the Tincture of Lobelia or Digitalis, and mix with the other ingredients. [We have never examined it ourselves, but would have supposed that the originator of the formula had used the fluid extract of ipecac, rather than the powdered drug, which must eventually form a deposit at the bottom.—Ed. AM. DR.]

No. 2,291.—Benzin as Cleansing Fluid (E. Ch.).

The use of benzin as a cleansing fluid for clothes is restricted to such stains as are caused by substances soluble in benzin. In place of moistening a sponge or rag with benzin and rubbing it over the stain, it is often preferable to thoroughly moisten the stain with benzin, then to place over it several layers of blotting paper, and a hot flat-iron on top of this. Instead of the greasy solution being wiped all over the fabric, as is done when a sponge is used, the grease, etc., will be drawn up into the blotting paper. On repeating the process several times, the whole of the stain is easily removed. In the case of paint-stains, this latter process will, of course, not answer, since the insoluble coloring material requires to be removed by friction. We prefer chloroform and a sponge in such cases.

The most satisfactory cleansing liquid for all kinds of stains, both soluble in highly volatile solvents, and those soluble in water, is a solution of benzin in polysolve. For this purpose, polysolve (Dr. Mueller-Jacobs'), preferably the ammonium compound (sulpho-ricinoleate of ammonium), is mixed with a little excess of ammonia, then with an equal volume of benzin. For use, a small portion of the liquid is diluted with from 4 to 10 volumes of water, and applied by means of a sponge or rag.

No. 2,292.—Friedrichshall and other Artificial Mineral Salts (M. J. B. & Co.).

In previous volumes we have given a number of formulæ for preparing both artificial mineral waters and artificial mineral water salts. These may easily be found by referring to the indexes. In addition to these, we now publish a few formulæ recommended by Eug. Dieterich:

1. Clemenshall Salts.

Sodium Chloride.....	945 parts
Magnesium Chloride, dry	35 "
Calcium Chloride, fused.....	5 "
Sodium Bromide, dry	5 "
Calcium Sulphate, precip.....	20 "

2. Friedrichshall Salts.

Sodium Chloride.....	377 parts
Sodium Bromide.....	3 "
Potassium Chloride.....	50 "
Calcium Chloride, fused	190 "
Magnesium Chloride, dry.....	370 "
Calcium Sulphate, precip.....	10 "

3. Kreuznach Salts.

Sodium Chloride.....	63 parts
Potassium Chloride.....	75 "
Calcium Chloride, fused.....	750 "
Magnesium Chloride, dry.....	110 "
Sodium Bromide, dry.....	2 "

4. Reichenhall Salts.

Potassium Chloride.....	60 parts
Magnesium Chloride, dry.....	730 "
Lithium Chloride.....	1.5 "
Sodium Chloride.....	140 "
Sodium Bromide, dry.....	8.5 "
Magnesium Sulphate, dry.....	70 "

No. 2,293.—Liquor Carbonis Detergens (B. & C.).

This is generally understood to denote the same preparation which is known under the name Coal-tar saponin (Lebeuf's). It has been much used in veterinary practice, and also, to some extent, by the medical profession in certain external diseases of man, or as an antiseptic.

It may be prepared in the following manner:

Tincture of Quillaja.....	100 parts
Coal Tar.....	50 "

Digest them during eight days at a moderate temperature, frequently shaking, and avoiding loss of alcohol. Finally filter.—The tincture of quillaja should be made, for this purpose, by means of alcohol of 65 per cent, best by percolation.

No. 2,294.—"Mistura Fusca" (J. D. P. G., La.).

This correspondent writes: I received the following prescription:

R Mist. Fuscæ.....	$\frac{1}{2}$ 3 <i>ss</i>
Spir. Æther. Nit.....	$\frac{1}{2}$ "

Upon examining the "Dispensatory," I could not find a drug or mixture bearing the name "Fuscæ."

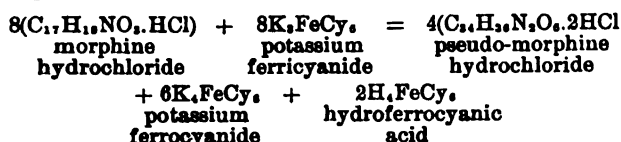
If our correspondent had consulted a Latin dictionary, he would have been able to solve the problem readily. Fuscus, a, um, is an adjective, meaning "brown." *Mistura fusca*, therefore, means "brown mixture," and, as everybody knows, this is the popular name for "Mistura Glycyrrhizæ Composita." Sometimes writers give the popular name as "Brown's Mixture," as if it had been originated by a person of the name of Brown. This is a mistake. The name is derived from the color. The adjective fuscus is also used in other pharmaceutical terms, for instance, *Syrupus fuscus*, or "brown syrup," is used as a synonym for "molasses."

No. 2,295.—Armitage's Test for Morphine (B. O.).

Some time ago, Mr. Lister Armitage announced a new test for morphine (see this journal, 1888, p. 70), which consisted in adding to the morphine a very dilute solution

of ferric chloride, and afterwards a little ferricyanide of potassium, whereby a blue color is produced. Armitage explained this reaction by stating that the morphine reduced part of the ferric salt to ferrous, which then reacts with the ferricyanide and produces Turnbull's blue.

Dr. O. Hesse subsequently denied the correctness of this explanation. He ascribes the reaction to the formation of pseudo-morphine and hydroferrocyanic acid, according to the following scheme (with morphine hydrochloride and potassium ferricyanide):



After the mixture of the two solutions, the liquid acquires an acid reaction, and if the solution is not too dilute, ferrocyanide of pseudo-morphine will be found deposited, in the form of a resinous precipitate, tolerably soluble in water. The reaction then is due to the ferric chloride acting upon the potassium ferrocyanide produced. The reaction is shown in a striking manner as follows: A small quantity of a moderately concentrated solution of a salt of morphine is added to a very dilute solution containing equivalent quantities of ferric chloride and potassium ferricyanide. A single drop suffices to produce in the iron solution a most intense blue coloration. If the morphine solution be extremely dilute, for example, 1 part in 1,000, no coloration is observed immediately, but in a few seconds the presence of morphine is shown by the appearance of blue streaks in the liquid.

The original paper of Dr. Hesse will be found in the *Pharm. Journ.* of March 24th, 1888.

No. 2,296.—Estimation of Arsenic or Antimony in Organic Compounds (Mel).

The most expeditious method for estimating the amount of arsenic or antimony in organic compounds, particularly those of definite chemical composition, is that by chromic acid, first announced by Cross and Bevan and subsequently improved by others. These chemists found that organic compounds are completely oxidized by being warmed with chromic and concentrated sulphuric acid.

To apply the method to the detection of arsenic or antimony proceed as follows:

Place 0.3 to 0.4 Gm. of the substance, together with 4 to 5 Gm. of chromic acid into a flask of the capacity of about 500 C.c., connect the flask with an upright condenser, and pour about 10 C.c. of a mixture of 2 parts of concentrated sulphuric acid and 1 part of water down through the condenser tube. Heat gently during one hour, then add again 10 C.c. of sulphuric acid, and continue heating for another hour. The heating must be done with great care, and when the reaction is over, and the contents of the flask are cold, they must be perfectly clear.

The liquid now contains all arsenic or antimony in form of arsenic or antimonious acids, which are tested for or separated in the usual manner indicated by the text-books.

No. 2,297.—Simulo (B. J. A.).

This is the name of a comparatively new drug, derived from the fruit of *Capparis coriacea*, which somewhat resembles a dried, unripe prune. Thomas Christy introduced the drug two years ago in form of a tincture. It has been recommended in epilepsy, by Hutchinson and Larrea. Dr. Hale White also reported favorably upon it, in the *Brit. Med. Journal*. On the other hand, it did not lead to very successful results in the hands of Prof. Eulenburg. At present it is tried in some of the public hospitals of New York. This will soon show whether it is of use or not.

Formulas asked for:

1. What is the composition of Kline's Nerve Restorer?
2. Piso's Cure for Consumption.
3. Piso's Catarrh Cure.

BIBLIOGRAPHY.

THE DISPENSATORY OF THE UNITED STATES OF AMERICA. By DR. GEO. B. WOOD and DR. FRANKLIN BACHE. Sixteenth Edition. Rearranged, thoroughly revised, and largely rewritten. With Illustrations. By H. C. WOOD, M.D., LL.D., etc., JOSEPH P. REMINGTON, Ph.M., F.C.S., etc., and SAMUEL P. SADLER, Ph.D., F.C.S., etc. Philadelphia: J. B. Lippincott Company, 1888. Pp. 2,091, large 8vo. Muslin, \$7.00.

The fifteenth edition of this work appeared in 1883, since which time the additions to and changes in our knowledge of drugs have been so considerable as to require a very thorough revision of the contents. The editors

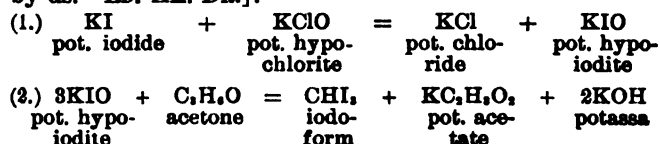
announce over 600 pages of new matter, but, to avoid an increase in the bulk of the volume, enough matter has been cut out during the revision to limit the actual increase in number of pages to 167. The following are a few of the changes noticed: Throughout the part devoted to official articles the text has undergone considerable alterations, some matter having been omitted here and there; matter has been subdivided so as to introduce new titles in many places, and one meets frequently with new paragraphs giving the result of recent researches. Part II., of unofficial articles, has been divided into two sections, the first consisting of the entire text of the National Formulary, and section second of the former list of unofficial articles, which has also received many

Spanish Licorice.

SPANISH licorice root, which is brought into commerce in very large quantities, partly direct for pharmaceutical purposes, and partly as the raw material for the extraction of juice, is gathered from the wild plant which grows in abundance in the provinces of Toledo and Saragossa. The total annual production of dried root in Spain amounts to about 6,750,000 lbs. Gathering commences in September and continues until March, but the root is not thoroughly dry and fit for shipment until five months after gathering. The first supplies of the new crop are, therefore, as a rule, brought to market in the month of April. From Valencia about one-tenth of the crop, say 700,000 lbs., are exported yearly, the United States taking about 275,000 lbs., and the rest being distributed to France, Belgium, and Germany. The Valencia exporters distinguish three grades of licorice, viz.: "Extra quality," which is exported in sticks of 8 inches in length, packed in bundles weighing about 6½ lbs. The second grade, called "Flor," is packed in bundles of about 13 lbs. The outside sticks are 14 inches long, but the inner sticks of the bundle are much shorter. The third and commonest quality is sent over in bales weighing about 1½ cwt., in sticks varying from 32 inches downwards. The present range of prices in Spain for the three varieties is as follows: Extra, 26s. per cwt.; flor, 21s. 6d. per cwt.; common, 12s. 6d. per cwt. The two better grades are packed in bags, one bag containing twenty bundles, but the third is shipped corded only. The best and the commonest roots are sent to the United States, the medium goods principally to Germany. When the root is cut to the usual bundle-size, the trimmings are collected and sold to the local juice manufacturers.—*Chem. and Drugg.*

New Method of Manufacturing Iodoform.

MM. H. SULLIOT and H. Raynaud have discovered a method whereby iodoform can be manufactured from acetone on a commercial scale, in such a manner as to transform at once the whole of the iodine employed. The process is the following: A solution is made of 50 Gm. of potassium iodide, 6 Gm. of acetone, and 2 of sodium hydrate in about 2 liters of cold water. Next a dilute solution of potassium hypochlorite is dropped slowly into the first solution, which is to be stirred all the while. Iodoform is immediately formed, rapidly concretes together, and precipitates. The operation continues until the whole of the iodide has been transformed into iodoform, and the yield is nearly equal to theory. As the reaction is not impeded by the presence of neutral sodium salts, even in considerable proportions, the process can be, and has been, successfully applied to the washings of varech ashes. All that is necessary is to first remove all sulphides and sulphites, and next to determine the quantity of iodides contained in the lye. A proportional amount of acetone being now added, the hypochlorite is let in drop by drop, and the whole iodine can thus at once be separated in the shape of iodoform. The following equations most likely represent the reaction [which has been recast by us.—ED. AM. DR.]:



No chloroform or iodate is formed at any stage of the process, and the mother waters contain caustic alkali and potassium acetate.—*Chem. and Drugg.*

Manicure Powder.—Oleate of tin, most commonly in use as a polishing powder for finger-nails, may be made by dissolving one part of white Castile soap in about sixteen parts of hot water, and adding gradually a ten-percent solution of chloride of tin until a precipitate no longer occurs. This precipitate is to be washed with water, and dried for use. Carmine may be used to color it.—*Dr. Cir.*

additions. Part III., relating to tests, has been revised and amplified. The chapter on mineral-spring waters contained in the fifteenth edition has been entirely omitted in this, effecting a considerable saving in space. As an indication of the increase in the amount of matter and the completeness with which the present edition is indexed, we will mention that this portion of the fifteenth edition covered 77 pages, while the index of this edition extends over 91 pages.

1863-1888: IN CELEBRATION OF THE TWENTY-FIFTH ANNIVERSARY OF THE FARBWERKE, VORMALS MEISTER LUCIUS & BRUENING. Hoechst on Main. 4vo. and fol.

THIS souvenir, issued by the well-known aniline color-makers and manufacturers of antipyrine, is an

artistic treasure such as we seldom remember having seen issued on such an occasion by any firm. In a tastefully embossed and printed portfolio is contained a quarto pamphlet giving a history of the works since their establishment. Accompanying this, is a fine, large, colored view of the works, and, as *pièce de resistance*, a folio carton, upon which are mounted, in the most tasteful manner, twenty flattened hanks of raw silk, dyed with various aniline colors, and so arranged as to present a perfect spectrum from red to violet, the beauty of which, especially when viewed under proper light, must be seen to be appreciated. The whole reflects the greatest credit upon the designers.

HAND-BOOK OF MATERIA MEDICA, PHARMACY, AND THERAPEUTICS. Compiled for the Use of Students Preparing for Examination. By CUTHBERT BOWEN, M.D., B.A., Editor of "Notes on Practice." Philadelphia and London: F. A. Davis, 1888. Pp. 366, small 8vo. Muslin, \$1.40 net.

This appears to be a very good compilation, and is published in attractive shape and size; but it is of the class of books which we wish might grow less instead of more numerous. Especially do we object to the multiplication of ready-made prescriptions and the tendency which such books encourage, towards acquiring a superficial knowledge of medicinal substances.

The greatest proportion of space is devoted to the therapeutic effects of the articles mentioned, and the least to questions of a pharmaceutical nature. Indeed, in few instances is there any mention made of other than the most general features of a pharmaceutical character. On page 57 *et seq.* the author gives a "Classification of Drugs Recognized by the United States Pharmacopoeia" which is unfortunate as a title, since it would lead many readers to suppose that the recognition referred to the *classification*, which is incorrect, since the pharmacopoeia makes none.

RECENT MATERIA MEDICA. Notes on their Origin and Therapeutics. Third Edition. By F. HARWOD LESCHER, F.C.S., etc. J. & A. Churchill, 11 New Burlington st., London, 1888. Pp. 92, 8vo.

The author states that nearly a hundred titles have been added to this third edition, and examination of the contents shows that very few, if any, of the recently announced remedial substances have been overlooked. The book is, in fact, a very admirable compilation of recent literature, so far as relates to the leading facts, and lacks but one thing to make it of greater value: that is a bibliographical reference list. For general use, however, the present contents will satisfy the ordinary requirements.

PICTORIAL HISTORY OF ANCIENT PHARMACY, WITH SKETCHES OF EARLY MEDICAL PRACTICE. By HERMANN PETERS. Translated from the German, and Revised, with numerous Additions. By DR. WM. NETTER. Chicago: G. P. Engelhard & Co., 1889.

PORTIONS of the original work were translated by us and published in the AMERICAN DRUGGIST in February and March, 1887, at which time we commended the work to the attention of our readers. We are pleased that the enterprise of the Chicago house has put this translation of the entire book in a form which makes it available for readers of English. At the same time we are inclined to doubt the expediency of the changes and additions made by the American editor, since they were not needed to increase the value of the original. Moreover, the text, particularly in this part, contains some striking misprints. The references to early

medicine and pharmacy in the United States, while interesting in themselves, might better have been published separately. At least it would have been better, so it seems to us, to have indicated in some manner the work of the editor and translator as distinguished from that of Mr. Peters. While the text is handsome and well arranged, the illustrations, owing to the defective method of reproduction, are not quite up to the quality of those in the original. These minor considerations aside, we have only words of commendation for the book, and assure our readers that they will not fail to be pleased with its perusal.

CLINICAL LECTURES ON ALBUMINURIA. By THOMAS GRAINGER STEWART, M.D., EDIN., etc. New York: Wm. Wood & Co., 1888. Pp. 250, 8vo.

The author is among the highest authorities on renal affections and has the additional merit of being an agreeable writer and accurate observer. The work at hand is based upon several contributions to journal literature and his former work on "Bright's Disease of the Kidneys," and accurately represents our knowledge of these affections at the present time. The list of references and the index are admirable features of the work.

193 ILLUSTRATIONS. THE VEST-POCKET ANATOMIST (Founded upon "Gray"). By C. HENRI LEONARD, A.M., M.D., etc. Fourteenth Revised Edition. Containing Dissection Hints and Visceral Anatomy. Detroit: The Illustrated Medical Journal Co. [No date.] Pp. 297.

This is a vest-pocket anatomist only in title, no vest-pocket in common use being capable of containing it. It is an improvement upon the ordinary cram-book only in so far as it furnishes illustrations, which greatly aid in memorizing the enormous aggregation of facts connected with this branch of study.

YEAR-BOOK OF PHARMACY. Comprising abstracts of Papers relating to Pharmacy, Materia Medica, and Chemistry, contributed to British and Foreign Journals, from July 1st, 1887, to June 30th, 1888, with the Transactions of the British Pharmaceutical Conference at the XXVth Annual Meeting held at Bath, September, 1888. London: J. & A. Churchill, 1888. Pp. 505, 8vo.

In addition to the usual contents, this issue of the year-book contains the British unofficial formulary, a feature which adds considerably to the value of the book as a work of reference for American readers.

THE CALENDAR OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, 1889. London, 1889. Pp. 541, 8vo. 2s.

While most of the contents of this calendar are of local interest only, there is no more convenient authority for the legal status of pharmacy and pharmaceutical education in Great Britain. It should be found in all public libraries in this country.

THE CHEMISTS' AND DRUGGISTS' DIARY, 1889. Twenty-first Year of Publication. Including Nostra Pharmaceutica, and other General and Special Information for the Chemical and Drug Trades.

This publication preserves its interesting character and practical value, and is alone worth the price of subscription to the journal. The space devoted this year to practical formulas and suggestions is unusually great.

MINERAL RESOURCES OF THE UNITED STATES. Calendar Year 1887. DAVID T. DAY, Chief of Division of Mining Statistics and Technology. Washington: Government Printing Office, 1888. Pp. 832, 8vo. Muslin, \$0.50.

This is the fifth in a series of valuable reports commenced in 1882, and contains a great deal of valuable informa-

tion. The chapter on mineral waters, by A. C. Peale, and another on mineral paints, are likely to be of especial interest to the drug trade. Copies of the report may be purchased by inclosing a postal note or money order to the director of the U. S. Geological Survey, Washington, D. C.

ANNUAL REPORT OF THE BOARD OF HEALTH OF THE CITY OF MINNEAPOLIS. For the year ending March 31st, 1888. Pp. 96, 8vo. With map. This is a model report, in so far as it covers the field of municipal sanitation.

PROCEEDINGS OF THE OHIO STATE PHARMACEUTICAL ASSOCIATION at its Tenth Annual Meeting, held in Columbus, June 12th, 13th, 14th, and 15th, 1888. Together with the Constitution, By-Laws, and List of Members. Pp. 144, 8vo.

This latest volume of an interesting series of reports is fully as interesting and valuable as its predecessors.

PROCEEDINGS OF THE TEXAS STATE PHARMACEUTICAL ASSOCIATION, held at Austin, June 12th, 13th, and 14th, 1888, etc. Pp. 59, 8vo.

PROCEEDINGS OF THE MINNESOTA STATE PHARMACEUTICAL ASSOCIATION at the Fourth Annual Meeting, held at Stillwater, Minn., June 12th and 13th, 1888. Pp. 140, 8o.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION at the Thirty-sixth Annual Meeting, held at Detroit, Mich., Sept., 1888. Also the Constitution, By-Laws, and Roll of Members. Philadelphia, 1888. Pp. 700 and 176, 8vo.

This is arranged in sections corresponding to the sections composing the association. Twenty-one papers and the allied discussions are included, and the report on the progress of pharmacy covers nearly 300 pages. The unofficial formulary, with an independent index, is bound with the proceedings, and adds greatly to the value of the volume.

REPORT ON HYDROPHOBIA. By CHAS. W. DULLES, M.D., of Philadelphia. Reprinted from the Transactions of Medical Society of the State of Pennsylvania. Pp. 8, 8vo.

A NEW SERIES OF BERLIN WOOLS FOR THE SCIENTIFIC DETECTION OF SUB-NORMAL COLOR-PERCEPTION (Color-blindness). By CHARLES A. OLIVER, M.D., of Philadelphia. Reprinted from the Transactions of the American Ophthalmological Society, 1886. Pp. 13, 8vo.

THE PREFERABLE CLIMATE FOR PHTHISIS; or the Comparative Importance of Different Climatic Attributes in the Arrest of Chronic Pulmonary Diseases. By CHARLES DENISON, A.M., M.D. Pp. 15, large 8vo, with map.

CATALOGUE OF THE TOKYO MEDICAL LIBRARY. Tokyo, 1888. Pp. 46, small 8vo.

WHY ELECTROLYTIC TREATMENT OF STRICTURE DOES NOT SUCCEED IN ALL HANDS. By G. C. H. MEIER, M.D. Pp. 18, small 8vo.

ESSENTIAL OIL OF SANDAL (Ol. Santal. Flav. Pur.): Its History, Preparation, and Properties. By L. MIDY, Pharmacien de 1re Classe. Paris, 1887. Pp. 39, small 8vo.

PHENACETINE (Bayer). A new Antipyretic and Antineuralgic. W. H. Schieffelin & Co., New York, 1888. Pp. 24, 8vo.

REPORT on the Experiments made in 1887 in the Treatment of the Downy Mildew and the Black-Rot of the Grape Vine, with a Chapter on the Apparatus for Applying Remedies for these Diseases. Prepared by F. LAMSON SCRIBNER, under the Direction of the Commissioner of Agriculture. Washington, 1888. Pp. 113, 8vo.

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Whole No. 178.

[ORIGINAL COMMUNICATION.]

COMMENTARY UPON SOME FORMULAS OF THE NATIONAL FORMULARY.

BY AD. TSCHEPPE, PH.D.

NO. 4.—LAC FERMENTATUM.

A. *Kumyss* (Nat. Form.).

KUMYSS is generally designated as fermented milk. As this term implies the meaning of alcoholic fermentation, the definition is incorrect, since lactic fermentation has as much share in shaping the final result, by acting on both the proteid substances and the sugar, as vinous fermentation does. It is not even the sugar contained in milk which is attacked by the ferment which induces alcoholic fermentation, for the product of its fermentation is furnished by sugar foreign to milk, purposely added to it. *Kumyss* may, therefore, more properly be defined as being obtained by alcoholic fermentation of sugar, not of milk, but in milk.

The various phases of the process which take place in the formation of *kumyss*, and the changes which the constituents of milk must undergo, may be thus briefly stated:

Some sugar is added to milk, then brewers' or cake yeast (grocers' yeast), and the mixture is left to itself. In the course of time, varying in length according to temperature, the effects of alcoholic and of lactic fermentation make themselves apparent: the first, by evolution of gas, through the splitting up of some of the sugar into alcohol and carbonic acid, of which the latter is the most conspicuous; the lactic fermentation, by the appearance of lactic acid, generated through a re-arrangement of the atoms in the sugar-molecule, and in the influence of lactic ferment, which transformation manifests itself by throwing the casein out of solution.

While albumen may be considerably acidulated without losing its solubility, casein, as an alkali-proteid, is soluble only in slightly alkaline solutions, and is extremely sensible, in this respect, towards acids. If lactic fermentation is so far progressed that neutrality is passed, the casein is thrown out as a coherent jelly, which, when undisturbed, becomes more compact by contraction and expulsion of serum, and finally conglomerates into separate fibrous lumps, which cannot be divided any more. But if this gelatinous precipitate is agitated ever so slightly in the incipient stages of its formation, it is readily broken up into an impalpable cream, which may be kept finely suspended in the liquid for a length of time, if the necessary conditions of temperature are observed.

If the generation of carbonic acid gas has been lively enough before the lactic fermentation produces its effects, or if it is aided by occasional shaking of the bottles, all the butter fat is enveloped in the precipitate of the casein without affecting its divisibility. Hence the function of the carbonic acid is this, that, by the expansion and mobility due to its gaseous nature, it reduces the casein to the finest possible condition—much finer than other mechanical means can do. When the precipitation and division of the casein are effected, and enough carbonic acid gas is found to cause lively effervescence, the *kumyss* is ready for use. The time in which this is accomplished depends on conditions of temperature at which the fermentation takes place, and on the proportions of the additions. Upon the observance of the most favorable conditions depends also the quality of the product, and it is here where the formula and the directions given in the National Formulary need a correction, in order to obtain an irreproachable preparation of *kumyss*.

a. *Addition of Sugar.*—Milk-sugar is not readily attacked by yeast. Contrary to statements in books that vinous fermentation will set in after the milk turns sour, and that thereby the milk-sugar becomes changed to glucose, I find that milk more easily enters fermentation under addition of an alkali, by which the souring is prevented. The same is the case with cane-sugar; and as it is desirable to have the alcoholic fermentation started before the lactic fermentation acts on the casein, the addition of fermentable sugar, in the shape of grape-sugar or honey, is indicated. Its quantity must be regulated according to requirements only. Nothing is more annoying to the unwary consumer than the opening of an overcharged bottle of *kumyss*, which generally results in the spattering of its contents promiscuously about the room. The quantity prescribed in the N. F. for two pints of milk is amply sufficient for two gallons, and may only be increased for *kumyss* dispensed in patent bottles, or if drawn from ordinary bottles by means of a tap.

b. *Temperature.*—The temperature prescribed in the formula may turn out to be disastrous in the manufacture of *kumyss*.

Milk is a peculiarly complex preparation. It is not an

emulsion, as sometimes stated in books, but contains the fat inclosed in separate cells, which rises to the surface as layer of cream if milk is left in undisturbed repose or subjected to centrifugal force. Boiling does not burst these cells or separate the fat; but if milk is left for hours at a temperature above the melting point of butter fat, 65° F., or if subjected to violent commotion, such as churning at the same temperature for a short time, practically all the fat is separated. Again, if casein is precipitated from fresh milk by means of acids, at any temperature, it incloses all the fat in its meshes, and also the jelliform casein separated from milk by rennet includes the butter firmly. But if milk is allowed to turn sour, the fat separates from the casein readily by keeping it a short time at temperatures above the melting point of the butter-fat. At the same time the finely divided casein conglomerates into more compact lumps, and the *kumyss* is spoiled.

Although milk, as long as it is sweet, may be kept at 90° F. with impunity, this same temperature is deleterious to the product after souring sets in. The casein turns lumpy, and the fat may be seen floating in the neck of the bottle as a yellow mass. This temperature is unnecessary for the manufacture of *kumyss*. Vinous fermentation takes place at much lower temperatures, and the higher degrees only favor the lactic fermentation by which the *kumyss* gets too acid to be drunk by the bottleful.

The sugar is not all consumed by either kind of fermentation. If milk is allowed to turn sour, only one-tenth to one-eighth part of its sugar is changed to lactic acid, and also the vinous fermentation stops before all the sugar is used up. But the lactic fermentation goes on slowly, acting on the sugar which is left, and the *kumyss* turns gradually more and more acid the longer it is kept. Pretty old samples of *kumyss* still react on Fehling's solutions.

In place of preparing *kumyss* with sweet milk, and waiting until it turns sour, the casein may be precipitated at once, by the addition of one-third of ready *kumyss* to fresh milk. Yeast is not necessary, but sugar must be added to produce enough carbonic acid gas to cause effervescence.

Kumyss may also be made from sour milk, freed of its crust of cream, by breaking up the gelatinous mass by vigorous concussion, and causing alcoholic fermentation by addition of sugar and yeast. This preparation would be nearly devoid of cream, but a proportion may be brought in by addition of sweet milk.

The time in which *kumyss* becomes ready for use depends as much on the quantity and activity of the ferment as on the temperature. With plenty of yeast and a prevailing temperature nearer to 90° than 60° F., the course of fermentation may be said to be even stormy, and the process is completed in as many hours as days may be consumed when the temperature is kept lower. But it is safer to operate at a lower temperature, by which a much finer product is obtained. Besides, by a slow after-fermentation, the *kumyss* becomes ripened, and in the course of one to two weeks a cheesy or butyrous flavor is acquired which is generally regarded as a necessary characteristic of good *kumyss*.

Commercial preparations of *kumyss* never correspond to fully undiluted milk. *Kumyss* made from undiluted milk is too rich and requires too great care to be practically handled by the large manufacturer. But the pharmacist who disposes of his own production directly to the customer may easily take the necessary precautions against disastrous influences, and may give his customers the benefit of an undiluted preparation which *kumyss* is supposed to be.

Samples of commercial preparations of *kumyss* I found either to be more or less deficient in cream, or to be made from watered milk, or both. Dr. Brush's *kumyss*, for instance, commanding the largest sale in this city, gave, on analysis, only two-thirds of the casein and fat in the proportions in which they exist in milk, indicating a corresponding watering of the milk.

B. *Kephir*.

This is a fermented milk beverage identical with *kumyss* in its finished state. It differs from the latter by being produced by aid of a different ferment. The *kephir* ferment was originally brought from the Caucasus, but may be procured in this market from home culture. It comes in the shape of grains of various forms and sizes, very much resembling bits of the inflorescence of cauliflower, constituting a compound fungous growth resulting from the cohabitation of a fleshy fungus with a certain species of *Saccharomyces*, which latter alone plays the active rôle of enacting vinous fermentation of the saccharine constituent of milk. This peculiar *Saccharomyces* differs from

the brewer's yeast by starting vinous fermentation in milk without addition of a fermentable sugar, and fermentation progresses to a certain advanced degree while the milk is yet sweet, or before lactic fermentation produces its effect. It is, therefore, possible to obtain an effervescing kumyss by its aid with a much less degree of acidity than that obtained by the *Saccharomyces cerevisiae*, and it may be concluded that kephir yeast is better adapted for the fermentation of milk than beer yeast is. By after-fermentation the same degree of acidity is reached as in kumyss obtained through the action of ordinary yeast. This peculiarity has led to a distinction in the use of the different stages of fermentation of kephir, as it has been observed that young kephir which is yet sweet acts as a slight purgative, while an older, or more acid, or "stronger" kephir exerts a constipating effect on the bowels, and is less easily borne by delicate stomachs.

Kephr kumyss is prepared by adding active kephir grains to milk, preferably kept at a temperature between 70° and 80° F., until the effect of fermentation becomes apparent by the rising of the grains to the surface, being carried upward by bubbles of carbonic acid gas attached to them. The grains may then be strained off, and the milk, which now contains enough yeast cells to insure the continuance of the fermentation, left to itself in well-corked bottles.

As the yeast cells propagate themselves, more fresh milk may be added previous to bottling.

The directions accompanying the kephir grains direct that the grains should be left in the milk until the casein separates from the serum, and that this strained product shall be used as the ferment of about four times its bulk of fresh milk. (Several prominent houses who sell kephir grains accompany them by printed directions which fail to start their activity altogether.)

If kephir is once obtained by this means, the further production may be simplified in the same manner as in the case of kumyss, by adding a quantity of ready kephir to a multiple of fresh milk, and this may be continued through many generations without having further recourse to the original kephir grains.

The printed directions recommend the employment of milk previously boiled. The advantage of this proceeding is supposed to be this, that the lactic fermentation is retarded, to which end a washing of the kephir grains with a two-per-cent solution of carbonate of sodium is prescribed for the removal of the rest of lactic acid tenaciously retained by the grains.

Commercial kephir grains may be found to be quite inert by the buyer uninitiated in the art of developing them properly. The fact is, that their activity must be first started, and directions to do so are given with the samples, but in spite of following them closely, they may fail to give satisfactory results. The secret of success seems to me to be to keep the grains in fresh milk at a temperature of 70° to 80° F., and to change the milk once or twice daily, or as often as the milk threatens to become sour. The time may have to be extended to a week, until their action becomes manifest by the generation of gas.

Kephr grains are also apt to decay, and these inert grains have to be removed. Those which retain their vitality may be recognized by their turgor or toughness to the touch, while the decayed ones crumble between the fingers like soft cheese.

The usefulness of kumyss as a dietetic hinges upon the fine division of its casein. Indeed, if a well-prepared kumyss is subjected to digestive influences, the finely-divided and diffused precipitate of casein dissolves at once, while the floccular casein, otherwise obtained, resists the peptic action remarkably long.

C. Matzoon.

Matzoon is a peculiar milk preparation, also stated on the label to be fermented milk, although there is no evidence of its having undergone alcoholic fermentation. It is devoid of gas, and appears as a viscid liquid, showing a rather coarsely granular mass of precipitated casein, well suspended in a serum which corresponds to that obtained from sour milk. Although betraying great richness from its appearance, the analysis gives amounts of casein as corresponding to undiluted milk and two-thirds of its cream.

1 fl. oz. of cow's milk contains grains (average).	Kumyss from milk.	Dr. Brush's kumyss.	Matzoon.
Sugar.....22	—	—	20
Casein.....14	14	10	14
Fat.....15	15	9	7
Lactic acid.....—	1.5	8	.1
Glucose. Lactic Acid.	Glucose. Alcohol.		
$C_6H_{12}O_6 = 2HC_2H_3O_2$	$C_6H_{12}O_6 = 2C_2H_5O + 2CO_2$		
Glucose yields by fermentation:			
	Alcohol, 48.5%.		
	Carbonic acid, 46.5%.		
	Glycerin, 3 6%.		
	Other products, 1.4%.		

5. LIQUOR ZINCI ET FERRI COMPOSITUS.

Deodorizing Solution.

A study, theoretical as well as practical, of the inside working of deodorizing agents elucidated the following facts. All animal and vegetable matters richly endowed

with proteids, if left to themselves, soon begin to decay by entering into putrid fermentation. They begin to exhale unsavory effluvia, which, in time, grow into a horrid compound stench of many individual smells. From this bouquet of bad odors a practised nose easily singles out the penetrating ammoniacal compounds, as well as sulphuretted and phosphoretted vaporous bodies, not yet named or individualized. If to such a putrid malodorous mass any kind of acid is added, one half of its offensiveness is gone. Soluble salts of aluminium, zinc or iron act in the same manner as free acids, neutralizing the ammoniacal bodies, but leaving the other half of the stench. It is only the acid radical in these salts which acts, the base being thrown out of solution as useless. And useless it is, as these bases have no power to bind the sulphur compounds securely enough, and their only advantage over free acids must be sought in their rendering the latter safer to handle, and in this, that by their employment neutrality of the mass is preserved even if a large surplus of the disinfecting solution is used. One pound of sulphuric acid is represented by about 3 pounds of sulphate of iron, and by about 2½ pounds of either sulphate of aluminium or of zinc. For the deodorization of the other more horrid and nauseating stench, the metal bases just named are powerless. But salts of lead, copper, mercury and those of the whole list of the precious metals readily capture and imprison these refractory bodies, and the entire complex of bad odors disappears on addition of any of these metals in solution. The stench is "silenced" or "deadened," as a certain pamphlet on disinfection has it, and the mixture turns at once "sweet," as the phrase goes.

Of the whole series of metals suitable for this purpose, copper is the most serviceable. Its sulphate mixes readily with those present in formula No. 241, and is at once cheap and effective. I would recommend the addition of one ounce per pint of the solution.

The formula would then read:

Sulphate of Zinc.....	16 tr. oz.
Sulphate of Iron.....	16 tr. oz.
Sulphate of Copper.....	5 tr. oz.
Naphthol.....	20 grs.
Oil of Thyme.....	60 min.
Diluted Hypophosphorous Acid.....	120 min.
Water.....	enough to make 5 pints.

[The title would have to be modified, so as to correspond to the new ingredient. We would suggest either *Liquor Zinci, Ferri et Cupri Compositus*, or simply *Liquor Deodorans*.—ED. AM. DRUGG.]

6. M'MUNN'S ELIXIR OF OPIUM.

This title had been proposed to the N. F. Committee for adoption, but on further consideration it was not listed in the book. The desire was to use the title as a synonym of the official "Deodorized Tincture of Opium," because it was supposed that by this semi-official recognition the latter preparation might get familiarized to those medical men who still cling to the secret preparation.

The proposition was objected to by one of the collaborators of the book, on the strength of certain general reactions, from which the dissimilarity of the two preparations was deduced. If these experiments or reactions were wanting in anything, it was the morphimetric assay of the preparations to solve the question forever. This want I have tried to supplement, and I may state the differences in the following table:

1 fluidounce contains	Grs. Morphine.	Grs. Extract.	Per Cent Menstruum Alcohol.	Narcotin
M'Munn's Elixir.....	3.6	10	80	none.
Deodorized Tinct. of Opium.....	6.3	24	47	none.

Note.—It must be remembered that the morphine is assayed as pure alkaloidal morphine, and that 6 grs. of this pure morphine corresponds to 7 grs. of the sulphate.

Rapid Analysis of Water for Industrial Purposes.

In most cases it is advisable to purify water previous to using it for industrial purposes when there is a solid residue of 0.3 Gm. or more per liter of the water. L. Vignou's method consists in saturating the acid carbonates contained in the water with lime, and then precipitating all the lime and magnesia salts still in solution with sodium carbonate. Phenolphthalein is used as an indicator, and decinormal clear lime-water is required. The titration is conducted in two narrow glass-stoppered cylinders of about 100 C.c. capacity. Into one 50 C.c. of distilled water and 10 drops of an alcoholic solution of phenolphthalein are introduced; this is then colored by 0.2–0.5 C.c. of the normal lime solution, and kept as standard. The other cylinder is filled with 50 C.c. of the water under examination, 10 drops of phenolphthalein solution, and 5 C.c. of a 10-per-cent neutral calcium chloride solution. The normal lime-water is then added until, on agitating, the solution remains colored. The standard is now diluted until its volume corresponds to the volume of liquid in the other cylinder, and a little lime-water added to one or the other solution until the color in both is identical. The difference in the quantity of lime-water used for the standard and for the water under examination gives the quantity of lime which has combined with the free carbonic acid in the water.

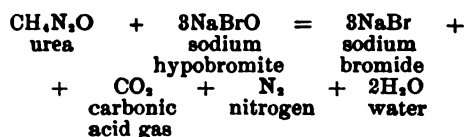
In order to determine the quantity of soda required to precipitate the lime in the water, 100 C.c. of the latter are mixed in a graduated 250 C.c. cylinder with the quantity of lime-water necessary to combine with any free carbonic acid, 5 C.c. of phenolphthalein solution then added, and the mixture, after shaking, allowed to settle. Exactly one-half of this solution is placed in one of the cylinders previously used for the colorimetric determination, and the amount of soda (containing 1 Gm. of Na_2CO_3 per liter) ascertained which is necessary to produce a recoloration. This must be equal in intensity to the standard made by adding to distilled water the same amount of phenolphthalein contained in the former solution and colored by a small quantity of the soda solution. From the above data the quantity of lime and soda which it is necessary to add to the water may be readily deduced.

Water containing notable quantities of magnesium sulphate or chloride cannot safely be tested by this method. —*Bull. Soc. Chim. and J. Soc. Ch. Ind.*

[ORIGINAL COMMUNICATION.]

THE ESTIMATION OF UREA.*

LIEBIG's method by precipitation with nitrate of mercury is probably of all methods the most reliable and accurate. But it requires great care and takes some time, unless all the reagents are kept on hand ready for use. Moreover, the process, as usually executed, is applied to a *measured*, not weighed quantity of urine, and therefore liable to yield variable results due to varying temperature, inaccuracy of measuring vessels, etc. Hence it is now deemed generally preferable to use, at least for practical or clinical purposes, a less circumstantial method, which can be applied in a short time. This is the *hypobromite* method of Knop. When hypobromite comes in contact with urea, or certain other readily decomposable nitrogen compounds, the latter split up into a carbon dioxide, nitrogen, and water:



If provision is made to have this reaction transpire in a confined space, and some liquid be present which will absorb the carbonic acid gas, only the nitrogen will be left behind, which may be measured, and thereby indicate the quantity of urea. This process is, of course, also affected with sources of error, among which the principal ones are, that the gas varies considerably in volume according to the temperature to which it is exposed; besides, a small portion of the nitrogen is lost by being retained in solution. Nevertheless, the results, if ordinary precaution is taken, are remarkably uniform. It should be added that the hypobromite exerts but little action upon the uric acid and other nitrogen compounds contained in the urine, outside of the urea. In this respect it has an additional advantage over Liebig's method. The results obtained are, for the reasons above mentioned, somewhat short of the actual quantity, but as this error is pretty nearly constant, it may be disregarded when making comparative experiments. Moreover, if a check-experiment is made with a solution of pure urea, the error may be easily eliminated.

We shall give a description of the process as we are in the habit of executing it.

The following solutions are kept on hand, ready for use:

A. Solution of Caustic Soda, spec. grav. 1.120.

B. Solution of 90 Gm. of Bromine and 75 Gm. of Bromide of Potassium in 360 Gm. of Water.

This solution is made as follows: The bromide of potassium is dissolved in 300 Gm. of water, and the solution placed into a measuring cylinder which is stoppered and accurately tared. It is then taken to a place where bromine vapors can do no harm, and 30 C.c. of bromine added to it, after which it is stoppered and replaced on the scale. If less than 90 Gm. has been added, this is easily remedied. A little excess does no harm. Finally enough water is added to make the contents weigh 525 Gm.

C. A solution of pure Urea, recrystallized from absolute alcohol and dried over sulphuric acid, containing 2 Gm. of the urea and 10 Gm. of chloride of sodium in 100 C.c. Theoretically, 1 Gm. of urea, when decomposed by hypobromite, should yield at 0° C., and at 760 Mm. pressure, 371.37 C.c. of nitrogen. But this is not obtained in prac-

tice. French chemists are in the habit of putting the figure at 340 C.c.; others use the figures 354, 360, etc. We find it preferable always to make a blank assay with 4 C.c. of the urea solution, which should, theoretically, yield about 29 C.c. of nitrogen, but which in practice will yield perhaps only 25. Whatever it may yield under the circumstances of temperature, etc., prevailing on the day of assay, is taken as equivalent to the urea present in 4 C.c., that is, 0.08 Gm. of urea.

D. A solution of chloride of sodium, spec. grav. about 1.120.

The process is executed as follows:

First pour into a measuring cylinder 95 C.c. of the soda solution (A), and afterwards 30 C.c. of the bromine solution (B). This reagent, if kept in a cool and dark place, may be preserved for a short time, but it is better to make it freshly when wanted.

Adjust the two tubes of the apparatus about as shown in the cut, open the faucet and pour into the open tube 40 C.c. of the hypobromite solution just prepared, which will rise a short distance up each tube. Now raise this tube until the liquid contained in it is just visible above the attachment of rubber tubing to the burette, and then slip a pinch-cock off the neck upon the rubber tube itself. Next pour into the open tube about 50 C.c. of the chloride of sodium solution, lower the burette as far, and raise the open tube as high as possible, and by carefully opening the pinch-cock before mentioned, cause the chloride of sodium solution to push the hypobromite solution along the burette until it is within a short distance of the stop-cock. Now transfer the control of the flow to the stop-cock until the burette is completely filled with liquid without a sign of a bubble of air. The use of the pinch-cock, therefore, is simply to prevent the chloride of sodium solution, when being poured in on top of the hypobromite, to mix with the latter so as to dilute it.

A quantity of the urea solution (E) is now poured into the graduated top of the burette, and the level of the two tubes reversed, the burette being raised high and the open tube low, the pinch-cock at the end of the latter being kept open by being slipped over the end of the glass tube. By carefully opening the stop-cock, exactly 4 C.c. of the urea solution are allowed to flow into the measuring burette. At once there will be a brisk generation of gas; but as the column of liquid in the burette acts as an aspirator, no gas is lost through the stop-cock, which is closed when 4 C.c. are added. After the first effervescence is over, the burette is taken from its clamp, being held high; and a stopper having been put into the top to prevent the contents from being spilled about, the tube is gently inclined to a nearly horizontal position, whereby the urea solution and the reagent are more thoroughly mixed. This is repeated once or twice, and when no more effervescence is observed, the tube is replaced in its clamp and allowed to stand for about fifteen minutes, so that the gas and liquid may acquire the temperature of the room. A longer time is still preferable. But when time presses, the

reading off may be done soon after the reaction is finished. In the subsequent actual test upon urine, the same manipulation and time must be observed. Finally, the two tubes are so adjusted that the level of the liquid in both is in one plane. The number of C.c. of gas is now read off. Supposing we find 30 C.c. Then these represent 0.08 Gm. of urea. Hence every C.c., under the conditions prevailing that day, represents 0.00266 Gm. urea.

After this blank experiment, the apparatus is cleaned, and the same process repeated, the urine itself being taken instead of the urea solution. In order that the results be as correct as possible, the amount of gas produced should, as nearly as possible, equal that in the blank experiment. Hence, if in one trial is found that 4 C.c. give materially more or less than 30 C.c. of gas, the experiment should be repeated with a proportionately smaller or larger amount, say 3.5 C.c., 4.5 C.c. or 5 C.c., as the case may be.

Each assay, in practised hands, requires only about ten minutes, not counting the time for allowing the apparatus to cool.

If the urine which is to be tested is cloudy, it must be filtered, by being passed through a *dry* filter. Passing through a *wet* filter would dilute it. If urine is very rich in urea, it is best—rather than to measure out a very small quantity—to dilute it to twice its volume with water.

When reporting the quantity of urea to a physician, it is customary to give it in percentage. We always make allowance, in making the calculation, for the specific gravity of the urine, so that our percentage figure truly represents *weight*. Many others merely take the quantity



* In reply to a query.

of urea as found in the *measured* amount of urine, and reckon out the percentage without correction. The error is a small one, it is true, but is easily avoided by multiplying the result with 1,000 and dividing by the specific gravity carried to 3 decimals.

A determination of urea in a fraction of a day's excretion, without the total volume of the latter being known, is of very little value, and physicians should be reminded of this, when they send samples to be tested. Supposing a sample has been voided by a person shortly after he has drunk a large quantity of liquid, perhaps on a hot day. This will certainly be abnormally low in urea. The whole quantity voided in twenty-four hours should always be carefully collected and sent.

Commercial Notes on Cinchona Bark and its Alkaloids.

THE Annual Report of the well-known firm of Zimmer & Co.* for 1888 contains some valuable and interesting notes and statistics, from which we take the following:

The principal place of production for [cultivated] cinchona barks has been and is still Ceylon, and the fluctuations occurring in its bark trade may, to a certain extent, be taken as measure for the general market.

It is difficult to obtain exact information regarding the actual condition of the Ceylon cinchona plantations. At all events, the alleged uprooting of plantations, on account of failure of revenue, need not be considered an absolutely assured fact. At the same time it is probably true that the cultivation has, to a considerable extent, been contracted, the plantations where cinchona alone is raised having diminished in number from 23,853 in 1885-6, to 12,541 in 1887-88. Some reports place the number of two-year-old cinchona trees at 36,655,000, while others put it as low as 16,000,000. The latter figure is probably nearer the truth. The contraction of cultivation is of course largely due to the fact that inferior species had been raised or improper localities had been selected. The experience, however, which has been acquired by the planters in the course of time will make a repetition of these errors improbable in the future. Moreover, the species which now constitute the main stock of the plantations are nearly all carefully-selected, high-grade ones, so that it takes a much smaller amount of bark to yield the same quantity of quinine than it did some years ago. While the quantity of bark shipped from Ceylon in 1887-8 was nearly 2½ million pounds less than in the preceding year, it is probable that the exports of both years represented about the same amount of quinine.

The direct shipment of Ceylon bark to the United States has very much diminished, as the following synopsis shows:

1885-86:	554,430 pounds.
1886-87:	392,027 "
1887-88:	100,980 "

The quality of Ceylon bark has become materially improved, since the inferior bark has almost ceased to be exported. What is brought to market now is derived, almost exclusively, from *Cinchona succirubra*, *C. officinalis*, and hybrids derived from them.

The amount of trees existing in the East India plantations, outside of Ceylon, is estimated as follows:

Sikkim.....	4,750,000 trees
Darjeeling.....	2,100,000 "
Neilgherry.....	7,000,000 "
Travancore, Wynaad, Mysore, etc.....	8,000,000 "

The export has risen from 699,258 lbs. in 1881 to 1,449,315 lbs. in 1888. Of course this does not represent the total harvest, since a very large proportion of the bark is worked up in India itself for "febrifuge" (an impure mixture of the alkaloids).

The great care and attention which has of recent years been bestowed by the Dutch upon their Java barks has resulted in a much higher percentage of alkaloidal yield than has been obtained elsewhere. The inferior species are being replaced, as rapidly as possible, by the valuable *Ledgeriana*, *Officinalis*, and their hybrids. The average amount of alkaloid in the barks at present exported is about 4 per cent, and will be considerably higher. In exceptional cases the alkaloidal percentage has risen to an astonishing figure, 10 per cent being not at all uncommon, and 16 per cent being the highest so far observed.

Considerable complaint has been made during last year over the damages caused by vegetable and animal parasites. Among the former was a dangerous fungus, *Hormiscium pannosum* Oud.; but energetic measures have by this time probably removed all danger.

It is estimated that there are about 60 cinchona plantations upon Java, with about 30,000,000 trees of different ages. The export of bark amounted, in 1883-84, to 1,104,524 lbs.; in 1887-88, to 3,742,025 lbs.

The German plantations of cinchona in Bolivia, upon

the eastern slope of the Cordilleras, to the north and east of La Paz (at Longa, Yungas, and Mapiri), continually increase their export, which has been rendered more profitable by the abolition of the Bolivian export duty of 3½ bolivares per quintal. In 1885, 2,599 colli were exported; in 1888, 7,810 colli. The bark, a *calisaya*, is excellent, yielding generally over 4 per cent of alkaloids. Part of it goes to London, the rest to Paris and Hamburg.

The cultivation of cinchona in Columbia has not yet made very decided progress, there being only three larger plantations, one near Bogotá, and the two others in the province of Tolima, near Columbia and Chaparral. They contain very young trees, but of valuable species, such as *Ledgeriana*, *Officinalis*, *Lancifolia*, and *Pitayensis* (the latter being specially rich in quinidine).

The following statistics are given regarding the import of bark and sulphate of quinine in the United States during the last 13 years:

	Bark (lbs.).	Quinine (oz.).
1875-76	5,290,159	22,746
1876-77	1,760,446	75,804
1877-78	4,826,290	17,549
1878-79	6,389,378	229,848
1879-80	6,018,877	416,998
1880-81	4,219,408	408,808
1881-82	5,010,547	794,495
1882-83	3,639,815	1,055,764
1883-84	2,588,307	1,263,732
1884-85	3,559,691	1,390,126
1885-86	4,447,082	1,251,556
1886-87	4,787,311	2,180,157
1887-88	2,801,448	1,628,414

The consumption of sulphate of quinine has been estimated in the Ceylon Handbook and Directory for 1887-88, to be as follows:

United States.....	3,200,000 oz.
Other countries (enumerated there, but omitted here,).....	4,256,000 "

These figures are regarded by competent judges to be not far from the actual facts.

Purification of Bisulphide of Carbon.

In a paper read before the Society of Chemical Industry, Ignatius Singer, after describing the methods and apparatus used in manufacturing bisulphide of carbon, made the following remarks regarding its purification:

The product obtained by the process before described contains considerable quantities of sulphur in solution, also a large amount of hydrosulphuric acid and other sulpho-compounds, which impart to it a pale-yellow color and a very disagreeable odor. Of these impurities it can be easily freed by careful rectification, leaving a colorless, mobile liquid of an odor not at all disagreeable, and resembling that of chloroform. Commercial bisulphide of carbon is seldom pure, and in many instances differs from the crude substance only in containing a lesser quantity of free sulphur, while nearly all the other impurities which impart to it that disagreeable smell are still contaminating it. From the latter it cannot be freed by simple distillation, as the hydrosulphuric acid and other gases distil over with it and are re-absorbed during condensation.

From the many methods which have been suggested for its purification, I shall describe the only one which can be employed on the large scale, the others being too expensive for commercial purposes, without offering any special advantages.

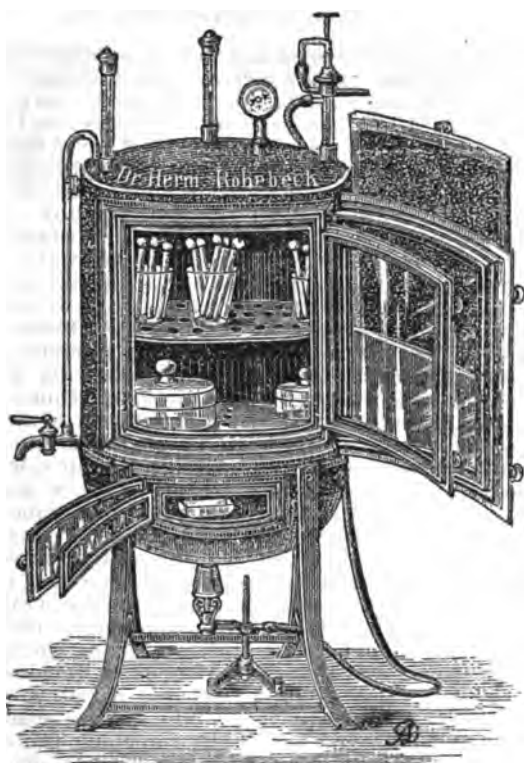
A cylindrical vessel, about thirty inches in diameter and six feet high, is provided with a perforated coil of lead pipe at the bottom. Into this vessel I run the bisulphide to be purified to about one-third in height. I then pump lime-water into it, the latter being introduced into the vessel, by means of a force-pump, through the perforated coil. The lime-water, being specifically lighter than the bisulphide, rises to the surface, and, while traversing the body of the bisulphide in a finely divided spray, the lime combines with the hydrosulphuric acid, etc. I continue this washing until the lime-water, which leaves the vessel through an overflow pipe near the top, is perfectly clear. The bisulphide is now run into a still, about one per cent of its weight of a cheap, colorless oil is added, and covered with a layer of about one inch of water, to which some acetate of lead may be added. The bisulphide is now distilled in a water-bath, and condensed in the usual way. A very pure product is obtained in this manner. I have treated in this way bisulphide bought from a Manchester maker, which was supposed to be "rectified." Its specific gravity was 1.292. After having washed it as just described, it had a specific gravity of 1.289, which was reduced to 1.286 after distillation."—After *J. Soc. Chem. Ind.*, 1889, 96.

To Make Holes in Earthenware, Porcelain, etc.—According to the *Scientific American*, holes may be bored in earthenware, porcelain, etc., by drilling, in a lathe, with a drill of soft copper, and a mixture of emery and linseed oil. The emery is fixed, by the friction, in the face of the copper drill, and the tool thus armed will perforate the hardest material in a very short time.

* Vereinigte Fabriken chemisch-pharmaceutischer Produkte, Feuerbach-Stuttgart und Frankfurt a. M., Zimmer & Co."

AN IMPROVED THERMOSTAT.

HERMANN ROHRBECK has constructed and put on the market a new form of thermostat, or apparatus for maintaining any desired temperature. This has a cylindrical shape with rounded bottom, which presents the advantage that the "dead" corners of the usual square apparatus are avoided, and that, by the more regular circulation of the heated water, a much more uniform temperature is insured. It will be noticed that the apparatus shown in the cut has several doors. The inner one has glass-windows, and permits the observation of the interior without admitting external air. The bottom part of the apparatus contains a chamber into which either a drying substance may be introduced, or some liquid for producing, when necessary, a certain amount of humidity within the apparatus. The temperature is regulated automatically by a thermo-regulator, the construction of which will be understood by examining the schematic cut. The interior heated air passes up through the tube A, surrounded by the heated water, and acts upon the mercury contained in the cylinder B. The handle C is previously adjusted so that the supply of gas from D will be shut off when the mercury rises to the predetermined temperature. Whenever the latter is reached, the main supply of gas will be shut off from the burner, but a small guiding flame will relight the latter as soon as the temperature begins



Rohrbeck's Heat Regulator.

to fall. By making the adjustment delicate, the oscillations in temperature may be made almost unobservable. The apparatus is further provided with a pressure and water gauge, and two thermometers—one to indicate the temperature of the water between the walls, the other that of the interior air.

A New Compound Antiseptic.

SINCE both corrosive sublimate and carbolic acid, though in dilute solution, sometimes produce toxic symptoms, and it has been demonstrated that very much smaller quantities may be used with equal effect, if combined with other antiseptics, Dr. Emil Rotter has devised the following compound, which he states to be powerfully antiseptic, and which may be kept in form of powder or tablets, to be dissolved in water when wanted:

Corrosive Sublimate.....	5 parts.
Chloride of Sodium.....	25 "
Carbolic Acid	200 "
Chloride of Zinc.....	500 "
Sulphocarbonate of Zinc.....	500 "
Boric Acid.....	800 "
Salicylic Acid.....	60 "
Thymol.....	10 "
Citric Acid.....	10 "

A quantity of one-half troy ounce of this mixture, dissolved in one quart of ordinary well-water [which is specially mentioned to show the adaptability of the powder to campaign purposes] yields a perfectly clear liquid.

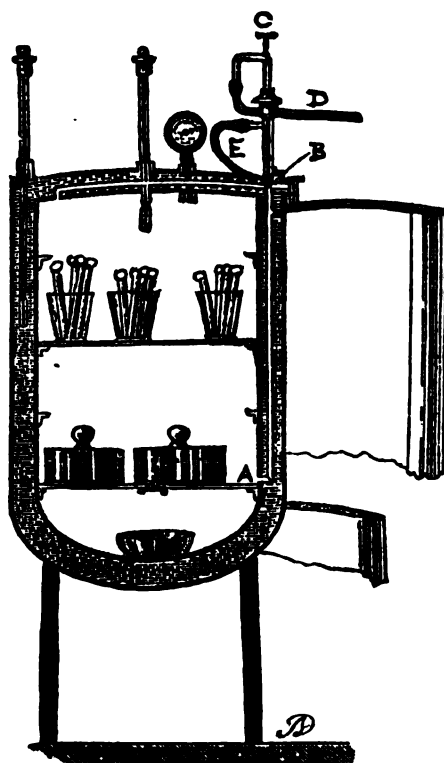
In cases where both carbolic acid and corrosive sublimate are contra-indicated, these ingredients may be omitted.—After *Therap. Monatsh.*

Sulphonal.

BAYER & Co., of Elberfeld, have succeeded in obviating one considerable inconvenience in the manufacture of sulphonal. Formerly this involved the preparation of ethyl mercaptan, which is very volatile, boiling at 36° C., and has, moreover, such a fearful odor, even when present in the atmosphere only in the slightest traces, that some of the manufacturers have had to remove their factories to remote districts, "far from the busy haunts of men." Now, sulphonal, it is found, can be manufactured from mercaptol without previous isolation of the mercaptan. According to the patent specification, 26 kilos. of thio-sulphate of ethyl and sodium sulphate are mixed with 5 kilos. of acetone and 50 kilos. of alcoholic hydrochloric acid. The whole is moderately heated, or allowed to stand for some hours in a closed vessel, when about 70% of the theoretical yield of mercaptol is produced. To the alcoholic solution water is added till all the mercaptol is separated as an oily liquid, which is directly oxidized by permanganate of potassium.—*Chem. and Drugg.*

Theophylline, a New Alkaloid from Tea.

A. KOSSEL, of Berlin, reports in the *Zeitsch. f. physiol. Chem.* (XIII., 298) that he has discovered a new base in



tea. At least, Dr. F. Witte, of Rostock, forwarded to him a quantity of extract which had been prepared by exhausting tea-leaves with alcohol, concentrating to a syrupy consistence, and removing the largest part of the caffeine by crystallization. [It would be interesting to know what kind of tea the extract was prepared from. Also, whether all tea-leaves, no matter where grown, contain the alkaloid.—Ed. Am. Dr.]

The base was obtained in the following manner. The extract was dissolved in water, and mixed with sulphuric acid which caused the separation of a resinous sticky mass. The liquid freed from the latter was rendered strongly alkaline with ammonia and precipitated with ammoniacal silver solution. The resulting precipitate was removed by filtration and digested with warm nitric acid. On cooling, the silver salts of adenine and hypoxanthine separated. These were filtered out, and the filtrate supersaturated with ammonia, which produced a dark brown flocculent precipitate consisting of the silver salts of xanthine and the new base, theophylline. The silver was removed by distributing the precipitate in water acidulated with nitric acid, and passing hydrosulphuric acid through it. On evaporating the filtrate, xanthine was first deposited in form of an amorphous or indistinctly crystalline mass. After further concentration, crystalline needles or columnar crystals separated, which were composed of the new body, theophylline. The portion remaining in solution was recovered, as far as possible, by converting it into double mercury or silver salts, eliminating the metal, and concentrating. Finally, the base was purified by repeated crystallization.

Analysis showed that theophylline has the same chemical composition as theobromine (contained in cacao), and paraxanthine (in kola nuts). But it is not identical with them, as is clearly demonstrated by the author.

Lactobionic Acid.

UP to the present time, the acid corresponding to sugar of milk containing the full amount of carbon existing in the latter, had been unknown, the usual methods of oxidizing milk-sugar having always led to acids containing not more than six atoms of carbon. Emil Fischer and Jacob Meyer now announce (in *Berichte*, 1889, 361) that they have discovered the acid in question. It ought to be called lactonic acid; but as this name has already been applied to another compound, the discoverers have chosen the name lactobionic acid (from lactobiose, a synonym for milk-sugar proposed by Scheibler).

As the salts of this acid are extremely soluble in water, and it is not improbable, on theoretical grounds, that some of these salts will be made use of, either in the arts or in medicine, in place of lactates, which are much less soluble—provided there is no objection from a therapeutic standpoint—we shall describe the mode of preparation, which will no doubt be further simplified.

Dissolve 1 part of milk-sugar in 7 parts of water, and add 1 part of bromine, at the ordinary in-door temperature. Shake repeatedly during a few days, when the bromine will gradually become dissolved. After two more days, pass a strong current of air through the lukewarm liquid to drive out the greater part of the uncombined bromine, and then pass hydrosulphuric acid, so as to convert the remainder of the bromine into hydrobromic acid. Next determine the amount of the latter by titration, add enough carbonate of lead to neutralize it, filter from the precipitated bromide of lead, and remove any remaining traces of hydrobromic acid by the careful use of oxide of silver. Again filter, treat with hydrosulphuric acid to remove any traces of lead or silver, and evaporate the filtrate to a syrup. This still has a strongly reducing action upon Fehling's solution. Mix it with much cold glacial acetic acid, and triturate for some time. This causes the glacial acetic acid to take up nearly all the reducing substances, while most of the lactobionic acid remains as a tough, white mass. The product amounts to about one-third of the milk-sugar employed. To further purify it, convert the acid into the lead-salt by adding to its warm aqueous solution a hot concentrated solution of basic acetate of lead, until this ceases to produce a precipitate. (The commercial lead-salt, according to the authors, seems to be unsuited for this purpose. They made it by dissolving 2 parts of neutral acetate of lead and 1 part hydroxide of lead in 3 parts of hot water, allowing the solution to cool, and redissolving the separated crystals, in pure hot water to saturation.) Filter off the precipitated lead-salt, while hot, wash it with hot water, then suspend it in cold water, and decompose it by hydrosulphuric acid. Evaporate the filtrate to a syrup, and remove from it the little acetic acid still present by treating the mass with alcohol and ether. Dissolve the residue in water, and again precipitate with alcohol and ether.

The residuary syrup is the lactobionic acid. It is very easily soluble in water, very difficultly in alcohol and cold glacial acetic acid, and insoluble in ether. The salts are very easily soluble in water. On evaporating their aqueous solution, they remain first as a syrup, which, by keeping over sulphuric acid, dries up to a colorless, very hard mass, which is, however, easily reduced to powder, and not distinctly crystalline.

Chaulmugra.

GREAT strides have been made with Chaulmugra Oil in England in regard to its application to open sores, wounds, sprains, and rheumatic complaints. It is now being extensively used in veterinary cases in some of the largest stables throughout the country, being especially useful in sores resulting from friction of the harness or from bruises, which horses travelling in the metropolis (London) are all more or less subject to.

Following up the results obtained on horses, the oil has been successfully introduced as an ointment to be applied to open sores on cattle, dogs, cats, and other animals. It would seem to act by causing the wound to heal with great rapidity and cleanliness; furthermore, its use appears to keep off the flies that cause so much worry and damage.

The properties of Chaulmugra oil applied externally in bruises, sprains and stiffness, are well known to sportsmen and cyclists, while sufferers from rheumatism, and stiffness of the joints attendant upon it, derive undoubted benefit from a good rubbing with it.

Thanks to the demand now ruling for the oil, the pressers in India have been enabled to take steps to ship it in ton lots at about one-third the price which it used to cost.

The English Government have adopted it, and use it in the cavalry and artillery regiments. The German Government have not yet decided to make trials, but it is largely used by the officers. If the students would use it for the wounds on the face caused by sword cuts they would not be so marked. [We fear the students of the German Universities would give the author of this sentence the chance of trying the chaulmugra upon his own face, if they were informed of this general proposition, and could get him on the "Mensur." Had the author referred to "some of the

students," his chances of escaping the before-mentioned fate would, of course, be greatly diminished.—ED. AM. DR.]

One great detriment to its easy application has always been its consistence, which, in our climate, renders it necessary to heat the oil so as to liquefy it. This has now been overcome by mixing it with *agnine*, a wool fat, with which Chaulmugra Oil combines well. This combination presents the appearance of a brown ointment, and by its means the beneficial action of the oil is more speedily obtained. The *Agnine*, which is readily absorbed into the skin, carries with it the Chaulmugra, and after a few seconds' rubbing not a trace of the ointment remains on the skin. Those who have had experience with the oil when used in a pure state know how slowly it is absorbed, and the uncomfortable greasiness and ungenial odor that remain. These defects are entirely avoided by the combination I have referred to.

Another very excellent combination consists in mixing Menthol and other ingredients with Chaulmugra Oil, which then remains fluid, for promptly relieving neuralgia, gouty and rheumatic pains, sciatica, and other aches of the nerves and muscles. To distinguish this from other combinations obtained with Chaulmugra Oil it has gone under the designation of *Mistole*, and as such it forms one of the most popular and efficacious remedies at present to be found in many a surgery and dispensary.—TH. CHRISTY'S *New Commercial Plants and Drugs*, No. 11.

Cold Prepared Extracts.

THE idea of concentrating watery solutions by freezing is not a new one by any means. But hitherto the process has for various reasons only been applied on a small scale. Mr. L. A. Adrian, in a paper read before the Paris Chemical Society, now describes a method based upon the same principle of crystallizing out the water, whereby pharmaceutical extracts can be readily prepared in large quantities with scarcely any heat being applied. The defects of the former processes—Herrera's for instance—are that (1) barely more than 60 per cent of the water is removed by freezing, and (2) the ice separated contains 10 to 20 per cent of the active principles, be the pressure ever so powerful. M. Adrian proceeds differently. Instead of partly freezing the extractive solutions, as Herrera did, he submits them to a temperature of -20°C . (4°Fahr . below zero) in an ammonia ice apparatus, and thus obtains solid blocks having an average temperature of -10°C ., and consequently very hard and brittle. The blocks are next passed through a peculiar shaving machine, where in less than one minute they are turned to snow, and the snow is transferred to a centrifugal extractor, which in barely twenty minutes separates out about 75 per cent of the water and but very little of the active principles. The concentrated liquid being once more treated in the same manner, only at a still lower temperature, a syrupy liquor is obtained which is concentrated enough to rapidly afford in vacuo a solid extract, without raising the temperature above 30°C . (86°F .). Experience has demonstrated that a third freezing would be useless, if not worse, as it is wasteful, and might injure the active principles. The solid extracts obtained by the foregoing process, as compared with those prepared in vacuo or by open-air evaporation, are very light colored, afford almost clear solutions with cold water, and present in a high degree the odor and the taste of the drug, without that familiar flavor of fire. The difference is especially noticeable in respect to insipidated juices of fresh plants, as in their case the vegetable albumin is not coagulated. Another point worthy of consideration is that the cold-process extracts will probably prove more active than the old-style preparations. Hence it would be well to ascertain the comparative therapeutic values of such extracts as belladonna or henbane, for instance, which are at the same time poisonous and more readily estimated. M. Adrian proposes, in a coming communication, to examine this side of the question.—*Paris Correspondent in Chem. and Drugg.*, March 2d.

Acetylphenylhydrazide.

ACCORDING to Prof. O. Liebreich, pure acetylphenylhydrazide is reported by Prof. Dreschfeld to have an antipyretic power four times as great as that of pyrocin [one of the recently introduced antipyretics, but which has been warned against by several authorities]. Consequently the doses which Dreschfeld has indicated for pyrocin (2 to 4 grains for children, and 8 to 11 grains for adults) would be too large for acetylphenylhydrazide.

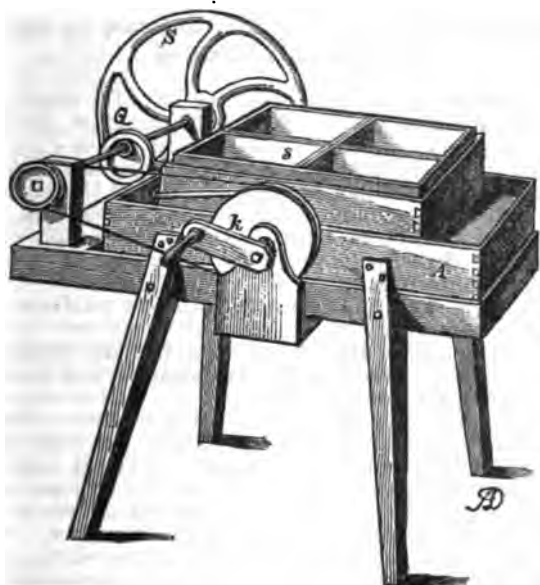
Liebreich gives the doses of the last-named substance as follows:

For children..... $\frac{1}{2}$ to 1 grain.
For adults..... 2 to 3 grains.
Highest dose for adults, and per day.... 4 grains.

It follows from this, that pyrocin and acetylphenylhydrazide are not identical, and that the latter may only be dispensed if it is prescribed under this name.—*After Pharm. Zeit.*

AGITATOR FOR CHEMICAL LABORATORIES.

PROF. A. STUTZER, of Bonn, describes, in the *Zeitsch. f. angew. Chemie* (1888, 698), a simple agitator or "shake apparatus" which promises to be of great use in chemical or pharmaceutical laboratories. The apparatus was originally designed for sifting certain mineral matters (Thomas slag, etc.) under normal conditions of fineness, time, etc., but its general applicability to other purposes where protracted agitation is required is almost self-evident. It is scarcely necessary to describe the apparatus, as its construction will be readily understood by examining the cut. The shuttle motion is produced by the eccentric position of the hinged wheel *Q*, attached to the front of the box.



Shake apparatus for laboratories.

As shown in the cut, the apparatus is constructed for hand-work. But in these days of progress and labor-saving devices, either an electric or a water-motor will probably be preferred, unless steam is readily available.

In some analytical operations, protracted shaking is known to produce more perfect results and in a much shorter time. Thus in the assay of opium (by Dieterich's or Squibbs' method), in the extraction of certain alkaloids by the method of immiscible solvents, and similar operations, an apparatus like that described above will be very serviceable.

Piche or Pichi.

UNDER the name of Piché, the *Fabiana imbricata* is known in Chili, Peru, and the Argentine Republic for its prompt and decisive action in diseases of the liver and in the urinary passages. This shrub, which might from its appearance be taken for a Conifer, belongs to the *Solanaceæ*, and grows on dry elevated slopes. It is remarkable for its light bluish-green branches, which contrast very much with the surrounding vegetation. The branches are subdivided into smaller ones, which are rounded, thin, covered with imbricated scales, which are really only thickened leaves, oval and acute in shape, of a length of about $\frac{1}{4}$ inch, and overlapping one another. Its flowers, which appear only in the second year, are placed at the extremity of the smaller branches, and are solitary; the calyx, which closely surrounds the ovary, is green, then yellowish, thick, with 5 long and obtuse lobes; the corolla is gamopetalous, with a tube dilated at its superior end, its throat is slightly compressed, lobes short, semicircular and small; stamens five, inserted in the tube of the corolla; anthers short, bilocular, opening longitudinally.

The fruit is oblong, ovoid, crustaceous, light brown, about two inches in length; the seeds are ovoid, nearly angular, with a crustaceous testa.

In commerce Piché consists of the stem, branches, and leafy branches; the large branches are from $\frac{1}{4}$ to $1\frac{1}{4}$ inches in diameter, covered with a thin, smooth bark, slightly wrinkled longitudinally, ash-gray in color, and having tuberculous protuberances. The smaller branches are from $\frac{1}{8}$ to $\frac{1}{4}$ inch in diameter, of a darker color than the preceding, and present at regular intervals distinct evidence of the place where the small leaves are inserted. The wood is of a yellowish-white color. All these parts of the plant are covered with a greenish or greenish-gray resin, which would appear to protect the surfaces of the plant, and so prevent the too rapid evaporation of its moisture during the very long dry seasons to which it is subject. It is now being cultivated in Europe.

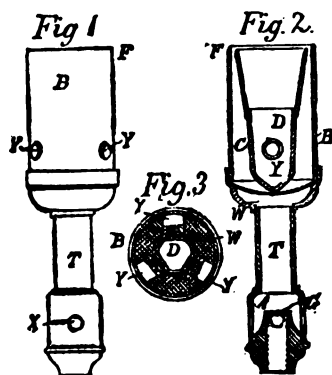
Piché is especially indicated in catarrhal inflammation, renal colic, prostatitis, cystitis, musky residual urine, renal calculi, inflammation of the ureters, etc.—*THE CHRISTY'S New Commercial Plants and Drugs*, No. 11.

BUNSEN GAS BURNERS.

THIS invention relates to the construction of a Bunsen in such a manner as to produce a circular flame with internal as well as external air supply.

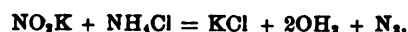
The gas, entering at the bottom, passes vertically through several small holes in a thin plate, *G*, into a cavity, *A*, into which air enters through lateral apertures, *X*. From the cavity the gas and air ascend a tube, *T*, which expands at its upper end to a diameter equal to that of the desired flame. The expansion is covered by wire gauze, *W*, which serves to mix the gas and air, and distributes the mixture uniformly through the enlarged part, *B*, of the tube. The mixture then ascends an annular passage, *C*, formed between the external tube, *B*, and an internal tube or thimble, *D*, which is closed at its lower end, and tapers to a larger diameter at its upper end. To the lower part of the thimble

there lead several inlets, *Y*, for air from outside the outer tube, *B*; these inlets being formed by short tubes crossing the annular passage, *C*. At *F* (the upper end of the tubes) the mixture of gas and air issues from the annular mouth between them; and this mixture, being ignited, forms a circular flame, which receives air, not only from the outside, but also from the interior of the thimble, *D*, to which the air is admitted by the inlets, *Y*. The upper part of the tube, *B*, and of the thimble, *D*, may be of metal. As shown, it is generally, however, preferable (says the author) to make the parts which are next the flame of steatite or such like material.—*Scient. Amer. Suppl.*



A NEW METHOD OF ESTIMATING NITRITES, EITHER ALONE OR IN PRESENCE OF NITRATES AND CHLORIDES.

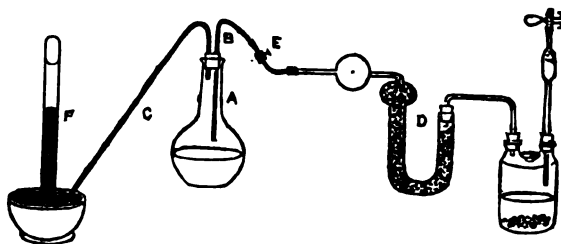
IN most text-books on chemistry a method is given for the preparation of nitrogen by heating a mixture of potassium nitrite and ammonium chloride, the change being represented by the equation



which may be simplified by saying that ammonium nitrite when heated, splits up into nitrogen and water, thus: $\text{NO}_2\text{NH}_4 = \text{N}_2 + \text{OH}_2$, the quantity of nitrogen produced being exactly double that present as nitrous acid in the nitrite.

The method here given consists in applying this well-known reaction quantitatively. I have never seen any mention of the use of this reaction for quantitative purposes, and I scarcely think that a method based on its use would have been omitted in any work on analytical chemistry if accurate results had been obtained by its means.

In order to test the accuracy of the method I have devised, I prepared a quantity of pure silver nitrite, NO_2Ag , and determined the amount of nitrogen it contained, comparing the results obtained with that required by the known composition of the salt. The process is conducted in the following way:



The solution containing the nitrite is introduced into the flask *A* (Fig. 1) (about 75 C.c. capacity), and an excess of solid ammonium chloride is then added till the solution is thoroughly saturated. It is important that the solution should be concentrated, otherwise considerable difficulty will be found in driving off the last traces of nitrogen. The flask is closed by a cork carrying the capillary tube *B* and the delivery tube *C* of somewhat wider bore, 1.5 to 2.0 Mm. Carbonic anhydride, generated from white marble and hydrochloric acid, in the apparatus shown in the figure is then allowed to flow through the flask until all the air is removed. The small U-tube, *D*, is filled with glass beads moistened with a little weak potash solution,

and is intended to intercept any acid spray which may be carried over by the current of gas.

As soon as it is considered that the whole of the air in the flask is displaced by carbonic anhydride, the screw-tap *E* is closed, and the flask disconnected from the carbonic anhydride apparatus. The end of the delivery tube *C* is now brought under the graduated absorption tube *F*, which contains mercury and a few C.c. of strong potash solution to absorb the carbonic anhydride. The solution in the flask is now heated till it boils. As long as any nitrogen is given off, the boiling liquid effervesces freely, but as soon as the last traces have been expelled, the boiling assumes the peculiar bumping character noticed in water free from dissolved gas. The boiling is continued till all the nitrogen produced in the reaction has been carried over by the steam and collected in the absorption-tube. The screw-cock *E* may now be opened, while the liquid is still boiling, and the flask removed.

The absorption tube containing the collected gas is removed to a vessel full of water, the mercury is allowed to fall out, and the volume of nitrogen obtained is measured after standing a few hours. The observed volume of nitrogen, when due allowance has been made for temperature, pressure, and tension of aqueous vapor, is halved, its weight calculated, and we have then all the data necessary for calculating the amount present in the nitrite under analysis.

The following experiments will show the degree of accuracy attainable by this method:

The weighed quantity of silver nitrite was in each case dissolved in hot water, and decomposed by a solution of sodium chloride. The solution was filtered through a small filter into the flask *A*, and the precipitated silver chloride washed repeatedly with small quantities of hot water, adding the washings to the solution in the flask.

Gm. NO ₂ Ag.	Gm. N. Half vol.	C.c.N.NO ₂ Ag. C.c.N. Theory.	C.c.
Expt. 1. 0.1864 gave	0.012138 = 8.90	9.02.	Loss, 0.12.
Expt. 2. 0.1700 gave	0.015579 = 9.12	9.02.	Gain, 0.10.
Expt. 3. 0.1712 gave	0.015452 = 9.02	9.02.	Exact.

I repeated the determinations in presence of excess of potassium nitrate. About 0.5 Gm. of this salt was added to the solution in each experiment:

Gm. NO ₂ Ag.	Gm. N. Half vol.	C.c.N.NO ₂ Ag. C.c.N. Theory.	C.c.
Expt. 1. 0.1716 gave	0.015455 = 9.12	9.02.	Gain, 0.10.
Expt. 2. 0.1808 gave	0.016556 = 9.16	9.02.	Gain, 0.14.

The results of these two experiments show that the presence of the nitrate does not affect the accuracy of the determination.—T. CUTHBERT DAY in *Journ. Chem. Soc.*, 1888, 422.

The Adulteration of Spices.

In the report of the Dairy Commissioner of the State of New Jersey for 1888, just issued, Dr. Wm. K. Newton, the Commissioner, quotes from a letter of Dr. E. H. Bartley, of the Brooklyn Board of Health, as follows:

"Both of the mills [spice-mills] I visited have sales-rooms in New York, while the grinding only is done here. According to their own statement, a very considerable proportion of the cheap mixtures made by them are sold to the trade, and are not sold under the firm name; that is, these mixtures are prepared in the mills and sold in bulk to other firms, who put them up in packages and sell to retailers, or ship in bulk to western cities. It is, therefore, not easy to trace a large part of these adulterated goods after they leave the mills. That they reach the market is certain, because they would not be manufactured for any other purpose. The information here given is based upon what I saw in the mills. Mustard was in process of preparation at only one of the mills. So far as my observation, on two separate occasions, went, the oil was expressed from all the mustard used in the factory. The cake from the press, after removing the oil, is used for the manufacture of table mustard. The hull or chaff from the black seeds was removed and used as an adulterant of black pepper. Besides the pure mustard prepared from the expressed seeds, mixtures are made containing corn meal, ginger, turmeric and red pepper. In some cheap mustard compounds there is but little mustard, and, according to the statement of the workmen, a mixture is sometimes made that contains no mustard at all, the pungency being obtained by the addition of cayenne pepper. Ginger was being prepared of several grades, varying from the pure article to those containing none at all. The adulterants used were corn-flour, corn-meal, pilot biscuit and cayenne pepper. In one of the mills I was shown a very good imitation of ground ginger, but which contained no ginger whatever. I was unable to learn for whom this was made, but was informed that there was a demand for it, and that it was used by the compounders. Cloves were seen in the process of grinding; they were mixed with burnt or charred walnut shells, to the extent of 50 per cent. Cinnamon is cheapened by the addition of ground almond and cocoanut shells. In

order to brighten the color of this mixture, a small amount of sienna is added. In some cases the cinnamon bark is ground alone, but in all the above mixtures which I saw in process of preparation, the cinnamon buds were mixed with the bark before grinding. There were very large quantities of ground cocoanut shells used in the factory. A very small amount of cayenne pepper is used to increase the pungency of these reduced cinnamon mixtures. I was shown several barrels of pepper compound, which was a very good imitation of ground pepper; it, however, contained no trace of pepper. This article was for shipment to New York, to be used for the purpose of 'reducing' ground pepper. Following is a list of articles used at this mill for adulteration: Cocoanut shells, natural and charred, walnut shells, corn-meal, buckwheat hulls and middlings, mustard chaff, ground charcoal and cayenne pepper."

The Decomposition of Potassium Chlorate in Contact with Metallic Oxides.

DR. HODGKINSON and Mr. Lowndes have for some time past been engaged in investigating the reaction between chlorate of potassium and metallic oxides, when they are subjected to heat, together, for the purpose of producing oxygen. Hitherto it has been supposed that the metallic oxide remained unchanged, and merely acted "by contact," or "by catalysis," that is—so it was supposed—it rendered the decomposition of the molecules of chlorate more regular and steady.

The chemists above mentioned have now published (in *Chem. News*, February 8th,) some of the results of their researches, which show that the views so far entertained are not quite correct. We will give the summary of their results in their own words:

"It is usually supposed that when potassium chlorate (KClO₃) and manganese dioxide (MnO₂) are heated together, the MnO₂ remains as such in the vessel, together with potassium chloride (KCl). In only exceptional cases does this appear to be the case. The manganese is to a greater or less extent in the form of lower oxides. Only when the mixture has been heated until the whole of the oxygen is driven off, and a gentle heat maintained for some time, is the manganese completely re-oxidized. In one case only out of a number of fourteen or fifteen, were we able, by continuous heating, to obtain MnO₂. In this series of experiments, a weighed quantity of pure potassium chlorate was heated with a weighed amount of manganese dioxide, in a cleaned, weighed test-tube. The residue in the tube was weighed after cooling." [It was found to correspond in weight with the theoretical amount of KCl and MnO₂, within 0.0006 Gm., a difference which is well within the limits of analytical errors.]

Gelsemine vs. Gelsemin.

A NEARLY fatal case of poisoning recently occurred on the Continent of Europe through the dispensing of the alkaloid gelsemine in place of the eclectic resinoid "gelsemin." Dr. Myrtle, of Harrowgate, had been consulted, by letter, by one of his patients travelling upon the Continent, and ordered for her the following prescription:

Quin. Salicyl.....	gr. 2
Ext. Colch. Aoet.....	1/2
Gelsemin	1/10
Morph. Hydrochlor.....	1/4

Ft. pil. 1. Mitte tal. xii. One to be taken every three hours.

The first pill produced very alarming symptoms, and it was ascertained that the pharmacist who dispensed the prescription had used one-tenth grain of the hydrochlorate of gelsemine. Dr. Myrtle subsequently found fault with the dispenser for not knowing that he, the prescriber, could not have meant the powerful alkaloid gelsemine, but rather intended the eclectic resinoid "gelsemin." He also finds—perhaps he had never noticed it before—that the terms of the "resinoids," ending in *-in*, and those of the alkaloids, ending in *-ina* or *-ine*, are too similar, and he wants this to be changed at once. (*After Chem. and Drugg.*)

Note by Ed. Am. Drugg.—Surely the proper way to "change this" will be by physicians never prescribing the eclectic resinoids, at all events in such cases where the crude drug contains both alkaloids and glucoside; for instance, in the case of hyoscyamus, digitalis, etc. As it is not likely, however, that many physicians will remember these cases, it would be well for them to drop the resinoids ending in *-in* on principle. Probably one of these, at least, will survive, namely, "podophyllin," and possibly also "leptandrin" and "euonymin," until such time as the active principles are obtainable in a pure form. But if any physician should write in a prescription,

Digitalin.....gr. 1

intending to mean the resinoid, and if the pharmacist were to dispense the active principle "digitalin," the blame would rest upon the physician, and scarcely at all upon the dispenser, particularly if the dose were not distinctly specified.

AN IMPROVED MICROSCOPE-LAMP.

THE well-known optical principle of total reflection has been applied to the construction of a novel lamp for microscopic use.

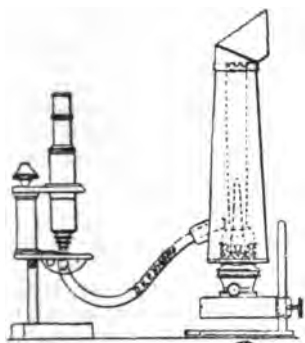
A lamp giving a bright light is used as the source. The lamp is completely covered so as not to diffuse any light laterally. When a transparent object is to be illuminated on the stage, a doubly-curved glass-rod, like that shown in the cut, is inserted through a lateral tube into an opening in the lamp case, the outer end of the glass tube is brought under the slide, and the latter receives thus the full light of the lamp, which passes through the rod. This mode of illumination has the additional advantage that the light is not accompanied by heat.

When opaque objects are to be illuminated, which must be done from above, a simply-curved glass rod is substituted for that shown in the cut.

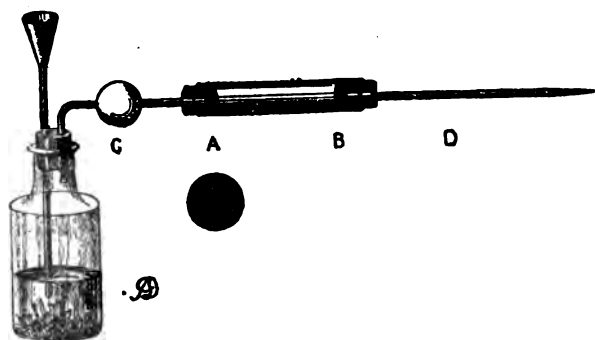
This lamp has been patented by Dr. W. Kochs and Max Wolz, of Bonn, and is for sale by Richard Fingerutt & Co., 4th Ave. and 28th st., New York.

TESTING FILTERING PAPER.

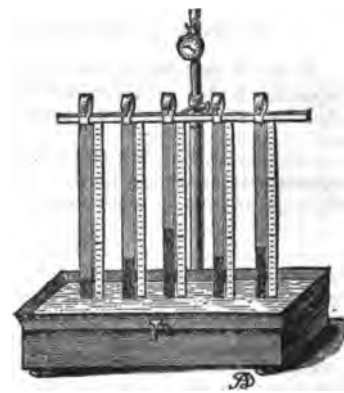
IN testing filtering paper, one feature, among others, should be specially paid attention to, namely the rapidity with which liquid will spread over a given surface. This may be ascertained by fastening to a frame a series of equal strips of various filtering papers, and then immersing them simultaneously in water. The exact time of immersion being noticed, it only remains to wait until upward diffusion stops, and then to read off, on the scale to which each strip is fastened, the degree or mark to which diffusion extended.—WINCKLER in *Papier-Zeit.* and *Z. angew. Chem.*



Microscope lamp.



Improved Marsh's apparatus.



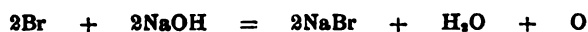
Testing filter-paper.

IMPROVEMENT IN MARSH'S APPARATUS.

DR. CANUDAS Y SALADA, of Barcelona, proposes a simple contrivance to do away with the risk of explosion when igniting the hydrogen issuing from Marsh's apparatus. It consists in several discs of wire-gauze placed into a tube of larger calibre than the exit tube of the gas. These discs are mounted in rubber rings, and placed at the extremity of either end of the larger tube so as not to leave any space between them and the rubber-stoppers. The accompanying illustration explains the arrangement.—After *L'Union Pharm.*, 1888, 442.

Easy Preparation of Oxygen.

DR. G. DENIGES, of the Bordeaux Pharmaceutical Society, has proposed for preparing oxygen a ready method, which may not answer for operations on the industrial scale, but will possibly be found convenient in a pharmacist's modest laboratory. The process is as follows: In an 8 oz. mattress introduce 40 C.c. of soap-maker's soda-lye, as much water, and 2 or 3 C.c. of concentrated solution of cupric sulphate. The cupric oxide at first precipitated is re-dissolved in the excess of alkali. The blue liquor is now heated to ebullition, and the mattress, on being removed from the fire, is closed with a cork provided with two glass tubes. One is for letting out the gas, and the other, having a glass cock, contains 10 C.c. of bromine. On causing the metalloid to come down drop by drop into the blue liquor, a continuous stream of oxygen will be evolved, easily regulated by means of the bromine cock. Near the end of the operation, should the liquid become too cool, it may be necessary to heat it gently to 60° or 80° C., which is the most convenient temperature for the operation. The following represents the reaction:



The cupric oxide takes no direct part in the chemical changes, but acts in the same way as cobalt and nickel oxides are known to do with hypochlorites, namely, owing to simple presence. Ten C.c. of bromine, weighing 29 grammes, will, with the foregoing process, afford about 1,800 C.c. of oxygen, or nearly nine-tenths of the theoretical quantity.—*Chem. and Drug.*

Note on Green Euonymin.

A SAMPLE of green euonymin came into my hands about a week ago which had a peculiar odor and appearance. I therefore made an analysis. The result fully proved my suspicion that it was adulterated to a large extent. It was of foreign manufacture, and represents a large bulk of the green euonymin now in the market.

Physical appearance: A rather light, somewhat sticky powder, of a pea-green color, with small black particles, as if a mixture of two substances, and of a peculiar heavy odor.

Under the microscope, the "euonymin" was seen to consist of a large percentage of lycopodium colored green; the black particles had no definite formation. Broken, transparent, colorless crystals were also observed, which were very slowly dissolved by a drop of water placed upon the slide. A drop of solution of potash dissolved them immediately.

An analysis was made, with the following result:

	Per cent.
Lycopodium.....	29.8
Dark green resin, consisting chiefly of ext. Indian hemp.....	15.2
Water extract: bitter extractive matter.....	20.6
Sugar of milk.....	30.0
Water.....	4.4
Total.....	100.0
Ash.....	1.2

The following remarks regarding the analysis may be of interest: 2.5 Gms. were dried on water-bath for moisture, then ignited for ash; 2.5 Gms. were added to 20 C.c. hot water, when the characteristic odor of Indian hemp was at once recognized. It was stirred, filtered and washed

until the washings were colorless, the residue dried, and weighed. Loss: Water previously determined and water extract.

The solution was of a very light color considering amount of matter extracted, neutral to test paper, and of bitter taste.

The behavior of the crystals under the microscope with potash solution and the low percentage of ash led me to suspect sugar of milk, which was confirmed by Fehling's solution. The quantity present was estimated by Fehling's solution, standardized by sugar of milk.

The bright green residue left after extracting with water was exhausted with hot spirit until all green coloring matter was dissolved; residue dried and weighed. The residue was of a light yellow color, and under the microscope was seen to consist entirely of lycopodium.

On evaporating the spirituous extract in a water-bath, a green resin was left, having the odor and all characteristics of extract of Indian hemp, and constituted 15.2%.

The above analysis tends to confirm several notes that have previously been published condemning green euonymin as being unsatisfactory and often inert. There is little doubt that the brown is usually much superior to the green variety now in the market.—H. S. COLLINS, *Chem. and Drug.*, March 9th, 1889.

Death from Atropine.

THOUGH atropine is a most decided and energetic poison, the number of deaths from excessive doses of it is comparatively small, most cases of poisoning by it, which received timely medical treatment, having eventually recovered. A fatal case, however, recently happened at Barcelonnette, France. The subprefect, who suffered from migraine, had consulted his brother, who was a physician, and the latter prescribed for him 1 gramme of antipyrine. The prescription, written hurriedly with lead-pencil, was sent to the apothecary Mr. Richaud, in whose absence his sister prepared to dispense it. But she read the prescription as "Atropine" 1 gramme. Upon Mr. Richaud's return the error was discovered, but it was too late. The subprefect had taken the dose, and all efforts to save his life proved futile.

Strophanthin.

THE crushed seeds of *Strophanthus Kombé* are treated with boiling alcohol of 70° for several hours, and the solution distilled to a small bulk on a water-bath; the distillation is finished in a vacuum, care being taken that the extract remains liquid. The residue is cooled, the supernatant oil and resin separated, the liquid filtered and heated with a small quantity of basic lead acetate and more finely powdered litharge. The liquid is again filtered, the lead removed by means of hydrogen sulphide, and the filtrate concentrated at 50° to a thick syrup, from which the strophanthin slowly crystallizes. The crystals may be purified by recrystallization from boiling water. The yield is 4.5 grammes per kilo.

Strophanthin is a white, bitter substance, which crystallizes in white, micaceous plates grouped around a nucleus. It readily retains water mechanically, and also forms a hydrate, which loses its water in a vacuum or in dry air. The hydrate melts below 100°, and the residual strophanthin is uncrystallizable. If, however, strophanthin is carefully dried in a vacuum, it may be heated at 110° without alteration. Anhydrous strophanthin becomes pasty at 165°, and partially decomposes. It acts on polarized light; the rotary power of a 2.3% aqueous solution $[\alpha]_D^{20} = +30^\circ$. It is only slightly soluble in water, and somewhat soluble in alcohol, but it is insoluble in ether, carbon bisulphide, and benzene. It is precipitated from its aqueous solution by tannin.

Strophanthin contains no nitrogen, and has a composition corresponding with the formula $C_{11}H_{14}O_{11}$. It seems to be the immediate higher homologue of oubain, which it closely resembles in properties. Perhaps these and all other cardiac poisons have a common nucleus.—*Am. Jour. Pharm. from Compt. rend.*, cvii., 179.

A New Adulteration of Spanish Saffron.

ADRIAN reports a new sophistication of saffron which appears to be very remarkable. On inspection the saffron did not show the least trace of the admixture of foreign substances; it had a remarkably bright color and a very aromatic odor. Nevertheless, it presented some physical peculiarities which attracted attention to it. It was heavy, though washing with water did not detach any insoluble matter. It was also very hygroscopic: if strongly rubbed upon white paper, it colored the latter yellow; and if compressed between the fingers so as to form a sort of ball, it retained this shape, while genuine saffron is quite elastic, and returns to its former loose-fibred state. The yellow fibres which are always found in saffron, and which are a portion of the style adhering to the stigmas, appeared to be few in number, though they could be recognized.

Examination showed that while pure saffron yielded 7.145% of ash, the suspected yielded not less than 26.4%. The latter was analyzed, and the different constituents having been combined in the manner usual in analysis, led the author to regard the original adulterant as being present in the following proportions:

Borate of Sodium, cryst.....	13.990
Sulphate of Sodium, cryst....	11.285
Tartrate of Potassium.....	10.096
Chloride of Sodium.....	0.117
Nitrate of Ammonium.....	8.142

Allowance was made for the salts found to occur in the ash of pure saffron, and the tartrate of potassium was assumed to have been originally present, while, of course, the ash showed only a carbonate.—*After Journ. de Pharm.*, Nov. 3d, 1889, 98.

Purification of Amylic Alcohol.

WHEN amylic alcohol is used, in chemical operations, as a solvent, particularly for extracting or dissolving coloring matters from acid liquids, it is often noticed that it becomes partly decomposed or resinified. At least, this is the experience of Dr. L. v. Udransky. Commercial amylic alcohol, as is well known, is a mixture of several isomeric alcohols, but for chemical purposes this is usually immaterial, so long as it is free from certain impurities, which themselves can originate a coloring matter. The most objectionable of these impurities is furfural.

After various experiments the author found that the latter is best removed in the following manner.

Prepare amylosulphate (sulphamylate) of potassium in the same manner as sulphethylate (sulphovinates) are obtained. Dissolve the salt in a small quantity of warm, pure alcohol, and precipitate it with a large excess of pure ether. It is thus obtained in form of crystalline laminae. Repeat this process 3 or 4 times. Then place the salt into a flask, cover it with a 10% sulphuric acid, and heat, under an upright condenser, during 5 hours on a steam-bath. Remove the separated amylic alcohol, shake it with calcium carbonate, separate it again and distil it with steam.

Amylic alcohol thus prepared is perfectly free from furfural. The latter would be readily detected by adding a little of it to concentrated sulphuric acid containing alpha-

naphthol in solution, which assumes a more or less colored (red) tint if furfural is present.

While ordinary amylic alcohol, when shaken with cold and concentrated, or hot and diluted solution of soda, acquires a tint itself and causes the alkali solution to become likewise colored, no such coloration is produced if the purified alcohol is employed. If the latter is free from furfural, it may be boiled for any length of time with concentrated solution of soda without showing any change of color. It may also be left in contact with acids, and exposed to the light.—*After Zeitsch. f. phys. Chem.*, XIII, 248.

Remedies in Cocaine-poisoning.

MORPHINE is to some extent an antagonist to cocaine, as it is to atropine; but no beneficial results appear to follow the administration of opium or morphine in cocaine-poisoning, even in large doses. Nitrite of amyl has been recommended as an antidote; it dilates the peripheral vessels, while cocaine contracts them. In cases of poisoning, however, it does not appear to have been of much use. The chief symptoms in severe cocaine-poisoning are referable to the nervous system; these are unconsciousness and convulsions. The latter, which are clonic in character, are cerebral in origin, since they are not produced in animals if the spinal cord be divided. However, death occurs either from respiratory paralysis or, perhaps more frequently, from tetanus of the respiratory muscles. Cocaine, in fact, acts upon the central nervous system from above downwards; it first affects the cerebral hemispheres, then the medulla oblongata, and finally the spinal cord. Chloral hydrate antagonizes all the actions of cocaine, except the rise of temperature. Although chloral itself produces a great fall of body temperature, it does not counteract the rise produced by cocaine. In poisoning by this alkaloid, Mosso, as the result of numerous experiments, advises the inhalation of ether or chloroform; in this way death by respiratory tetanus is prevented. When the patient is recovering somewhat, chloral in small doses may be administered. But prevention is better than cure, and there is no doubt that as great care ought to be taken in using cocaine for its local anæsthetic effect as in the exhibition of any other powerful drug, and especially is this the case when it is injected hypodermically.—*Chem. and Drugg.*

New Method of Purifying Alcohol.

A PATENT has been granted to Ernst Holz, of Berlin, for a new process by which amylic and other higher homologues of ordinary (ethylic alcohol) may be removed therefrom. The process consists in passing the hot alcohol vapors through a boiling alkaline solution of copper, interposed between the still proper and the condenser. A solution similar to that made after Fehling's plan may be used. Any amylic compounds which accompany the alcohol are thereby oxidized (under simultaneous reduction of the copper to cuprous oxide) into the corresponding fatty acids (valerianic, butyric, propionic), which immediately combine with the alkali present and are thus retained in the liquid. The alcohol itself is said not to be affected in the least by the copper solution. When the solution is spent, the ingredients may be reworked and used over again.

A New Kind of India Ink.

THE following communication was recently addressed by B. Piffard to the Editor of the *Chemical News*:

"I find that a color apparently identical with India ink can be produced by the action of sulphuric acid on camphor.

An excess of camphor should remain some 24 hours in strong sulphuric acid; it then results in a gelatinous mass of a slightly reddish color. This, when heated, effervesces, gives off fumes of sulphurous acid, and turns intensely black. By evaporation, the superfluous sulphuric acid and camphor (for there remains an excess of both, the weakened acid not acting on the camphor) can be driven off. The remainder, when applied to paper as a paint, appears, to my unartistic eye, to be India ink. When dissolved in water, it remains an indefinite time without precipitating. It appears to be dissolved, not held in suspension."

Interchange of Certificates of Pharmacy Boards.—The Wisconsin State Board has adopted a resolution to "grant full certificates to all licentiates of other States whose examinations correspond with that of Wisconsin, and if the applicant gives proof that he has had five years' practical experience and passed a successful examination. The secretary of the Wisconsin Board will register and issue certificates to such applicants when above proof is furnished and a fee of \$2.00 paid for registration. An assistant's certificate is granted to those having less than five years' experience."

Adulterated Drugs.

From the last report (1888) of Dairy Commissioner Dr. Wm. K. Newton, of New Jersey, we take the following notes on various drugs and chemicals.

Bicarbonate of Sodium.

Twenty-eight samples were analyzed, of which nineteen were equal to the legal requirements and nine were impure. The United States Pharmacopœia recognizes two qualities—one, the pure bicarbonate of sodium, used for internal medication; the other, commercial bicarbonate of sodium. In applying the tests required by the authorities, we were governed by the source whence the sample was obtained. If from a druggist, it was presumed to be the variety used in medicine, and all impurities were sought for; if from a grocer, the sample was expected to conform to the tests prescribed for a commercial article. Little excuse may be offered for the presence of impure sodium bicarbonate in any store in this State, for the pure article may be easily purchased, and at as low a figure as the debased. The chief impurities were sulphates and chlorides; in a few instances there was an excess of carbonate.

Cream of Tartar.

Ninety-five samples of cream of tartar were analyzed, of which forty-six were standard and forty-nine impure. This result I had expected, for few articles are so commonly debased as this one.

The Pharmacopœia requires that this substance shall be at least 94% pure, a limit unnecessarily liberal, for cream of tartar containing but one-half of one per cent of impurity is easily obtained.* The standard article, as required by law, must contain no sulphate or chloride, and not more than 6% of tartrate [of calcium].

The adulterations detected, in the greater number of debased samples, were clearly intentional, and were not due to lack of care in the methods of manufacture. An excess of tartrate or traces of chloride may well be considered as due to want of skill or lack of care in the maker, but the presence of sulphates, phosphates, alum, and flour can be accounted for in one way only—that is, they were added for fraudulent purposes.

Several unique samples were examined. One, purchased at Beverly, contained no cream of tartar, but was a mixture of flour, acid phosphate of lime, and sulphate of lime; another sample of the same kind was sold to one of my agents at Cape May. A sample was sold by a dealer at Pemberton that proved to be a mixture of alum, phosphate of lime, and 64% of cream of tartar. Several were obtained in different parts of the State that were adulterated with impure acid phosphate of lime.

The samples that were equal to the standard were, in at least 90% of the cases, obtained from druggists, but many from this source were badly debased.

The impure cream of tartar obtained in this State came largely from the southern and western sections, and was sold to dealers by agents and jobbers from Philadelphia. There appears to be a certain relation between the fertilizer trade in that city and the bogus cream of tartar business, the connection probably being due to the trade in impure phosphates.

Two suits were instituted against dealers in the very impure article, these being settled on the payment of costs when the dealer promised to return the adulterated article to the wholesale dealer and to sell only the pure article. Warning notices were sent to all other dealers detected in selling adulterated cream of tartar.

Iodide of Potassium.

Fifteen samples of iodide of potassium were examined, of which four were equal to the requirements of the United States Pharmacopœia, and eleven were impure, according to the tests directed by that authority. The impurities were excess of alkalinity, presence of undue quantities of iodate and traces of carbonate. As was said in connection with other articles, the large number of impure samples can be accounted for by lack of care by the manufacturers and improper methods of purchase by the dealer. The excess of alkali and the presence of carbonate is due to what seems a desire on the part of the maker to produce a fine-looking crystal, with a translucent, waxy appearance. It is possible to produce, and to purchase, iodide of potassium answering all the tests of the Pharmacopœia.

Seidlitz Powders.

Twenty-eight of these powders were examined, of which twelve were equal to the requirements of the law, and sixteen were deficient. The quality of the ingredients was found to be good, but the deficiency was all due to errors in weighing the substances entering into the composition

of these powders. It is the custom with many apothecaries to buy Seidlitz powders in large quantities from manufacturers who make a business of preparing them, and dealers of good reputation may be relied on to sell a correctly compounded article. Others, on the other hand, competing in price, reduce the weight of the ingredients to such an extent that a profit is insured. This popular aperient is sold also by fancy-goods dealers, and even in dry-goods stores, in our large cities, and they sell the powders as they would other articles, simply for the profit, caring little for the quality or weight of the ingredients.

The dose contained in one of these powders has been accurately ascertained, and any reduction in the quantity is not only fraudulent but injurious.

The United States Pharmacopœia prescribes that the contents of the white paper shall weigh 35 grains, and the contents of the blue paper 160 grains.

(The appended table shows a variation, in the "white paper" powder from 18 to 42 grains, and in the "blue" from 107 to 170 grains.)

Compound Spirit of Ether.

Nine samples were examined, of which one was equal to the legal standard and eight were inferior.

The Pharmacopœia states that compound spirit of ether shall contain 3 per cent of ethereal oil or heavy oil of wine. This is an essential ingredient, and one that gives to the compound its therapeutic value. In former times this preparation was much used by physicians, but of late it has fallen into disuse, because the required effects were not obtained. This failure as a medicament, and consequent disuse by the profession, is no doubt due to the fraudulent method of preparation now so common. The chief reason for the omission of the active ingredient is that it costs \$25 a pound, hence druggists do not buy the ethereal oil, but sell an article not answering to the pharmacopœial requirements.

Spirit of Nitrous Ether.

Nine samples were examined, of which none were equal to the legal requirements. The same remarks may be made with regard to the sweet spirit of nitre as were made in connection with the previous article; it is extremely difficult to obtain a specimen having the qualities demanded by the Pharmacopœia. In the case of this drug the difficulty is due to the lack of care in its preparation, and also to the faulty methods used to preserve it when made, for it is a very delicate article, and should be kept in small, well-stopped bottles and excluded from the light. It is proper to state, however, that the tests given in the Pharmacopœia are inaccurate, and that sweet spirit of nitre made strictly in accordance with the official formula will not always respond to these tests, even if applied to the spirit immediately after manufacture.

Tincture of Opium.

Forty-two samples of this tincture were analyzed. Eight of these were standard, and thirty-four did not contain the quantity of morphine required by the United States Pharmacopœia. That authority directs that tincture of opium shall be made of the powdered drug in the proportion of ten parts to 100 of the finished product, and as standard powdered opium contains not less than 12 per cent and not more than 16 per cent of morphine, the tincture must contain at least 1.20 per cent and not more than 1.60 per cent of the active ingredient—morphine. Hence, an ounce of laudanum should have in it, on the average, about 6 grains of morphine.

The law requires that articles described in the Pharmacopœia shall in no way differ from the standard of strength, quality, or purity laid down therein; hence, any tincture of opium not equal to the standard cannot legally be sold in this State.

The importance of adhering closely to the official formula, and of employing only a drug of standard strength in the preparation of this tincture, must be conceded by all, for no more potent medicament is used so commonly as laudanum. The necessity of standard strength must be patent to all, for if a physician is accustomed to prescribe a well-made tincture of opium he obtains constant results, but if the patient is supplied with an inferior article, or one stronger than the standard, disappointing or dangerous results ensue.

The causes of the great discrepancy of so many samples are many and easily ascertained. A weak tincture may be due, when made of opium of minimum strength, to the fact that the drug is not thoroughly exhausted; or gum-opium has been used, contrary to the formula of the Pharmacopœia; or opium of inferior strength has been used; or other formulæ than the official one have been followed; or the tincture has been made weak intentionally.

A large number of the samples assayed were bought at stores through the rural sections of the State, and all of these were below the standard. Those bought at regular drug stores managed by registered pharmacists were more close to the limit, but too many were below the legal standard. In the latter case no proper excuse can be offered, for a person holding the license of the State Board of Pharmacy is reasonably presumed to be conversant with the requirements of the authorities.

*This is indeed true now, but it was by no means the case when the pharmacopœia was last revised. The great improvement in processes, and consequently in purity, occurred subsequent to the issue of the last pharmacopœia.
—Ed. Am. Dr.

My investigation, in this relation, revealed many important facts concerning the prevalence of the opium habit, and I was surprised to learn the amount of this potent drug, and its tincture, that is sold at country grocery stores; but that the consumption of this article is great, and increasing, was no surprise to me when I ascertained how easily the article could be obtained notwithstanding the State law that bottles containing the tincture should be labeled and not disposed of to irresponsible persons.

On the Testing of Lard for Cotton-Seed Oil and Beef Stearin.

THE following paper on this subject was read by John Pattison, F.I.C., at a recent meeting of the Society of Chemical Industry:

As much attention has recently been drawn to the prevalence of lard adulteration, I thought it would interest some of our members if I described briefly some of the methods by which these adulterations are detected and measured.

Although chemists have only lately been able to speak with certainty as to these adulterations, it has for some years been well known that lard, which ought to consist only of the fat of the pig, is very largely adulterated with cotton-seed oil and beef stearin, and occasionally with water. Some of the American lard packers are the greatest offenders in this respect; but they are not the only offenders, for well authenticated cases are known in which both English and Irish prepared lards have been found to contain similar adulterations.

To detect cotton-seed oil and beef stearin in lard and to form an estimate of the quantity, the following tests are chiefly relied on: Some form of the nitrate of silver tests for cotton-seed oil, the microscopical appearance of the crystals formed from an ethereal solution of the lard to detect beef stearin, the iodine absorption equivalent, and the specific gravity. Useful information is also afforded by an examination of the color, taste, smell, and consistence of the lard.

The Nitrate of Silver Test.—This is based on the reducing action of cotton seed oil upon nitrate of silver imparting a color to the lard. I have been unable to obtain constant or trustworthy results with this test as applied by Becchi [see, however, regarding this, *AMER. DRUGG.*, 1888, 110], who, I believe, first proposed it, nor have I been more successful with the more complicated modification of Milliau, which consists in applying the test to the fatty acids separated from the lard, nor with the several other modifications of this test which have been published. I obtain, however, very regular and certain results by adding an alcoholic solution of nitrate of silver to an ethereal solution of the lard. The method is as follows: 40 drops of the melted lard are placed in a test-tube, and dissolved in 10 C.c. of ether, and to the solution 2 C.c. of an alcoholic solution of nitrate of silver (1 of nitrate of silver to 100 of alcohol) are added. The tube and its contents are left to stand for five or six hours in a place protected from light. If the lard contains cotton-seed oil, the silver is reduced and imparts a maroon color to the solution—the depth of the color depending on the proportion of cotton-seed oil the sample contains. By comparing this color with the colors produced in solutions of pure lard to which known percentages of cotton-seed oil have been added, a close approximation to the amount of cotton-seed oil in the sample can be obtained. Five per cent of cotton-seed oil in lard can be readily detected by this method.

Test for Beef Stearin.—The positive evidence of the presence of this substance in lard is best obtained by examining under a microscope the crystals formed from an ethereal solution of the lard, as proposed by Dr. Belfield, of Chicago. For this purpose I use the ethereal solution of the lard mentioned in the last paragraph. Should crystals not form in the cold solution, the cork of the tube is removed and a loose plug of cotton wool is substituted. The solution is then left to evaporate spontaneously until crystals form. It is sometimes necessary to redissolve the crystals, if they have been formed rapidly, by warming the solution, and sometimes adding a little more ether, so as to obtain crystals which have been slowly formed. Some of the crystals are then removed by a pipette, placed under a microscopic slide, and examined. The crystals of beef stearin form curved tufts somewhat of the shape of the short tail of the horse. The terminals should be pointed and hair-like. Lard crystals are usually found in oblong plates, occasionally radiated, and have oblique terminals.

The Iodine Absorption Test.—This was first described by Hübl, whose method is given in the *J. Soc. Chem. Ind.*, 1884, page 641 [and in most works of reference]. According to my experience with lards of known purity, I find the iodine absorption equivalent of pure lard when tested by Hübl's method, to vary from 57 to 63 per cent, and cotton-seed oil to vary from 105 to 116 per cent. Were the lards to be examined for only mixtures of cotton seed oil and lard, it would be easy to arrive at a fairly close approximation to the actual amounts of each present from this test alone. This, however, is never the case, as probably all lards which contain cotton-seed oil have also had

beef stearin added to make the mixture of a suitable consistency. Beef stearin has an iodine absorption of from 23 to 28 per cent, while beef fat, which may also have been used as an adulterant, has an iodine absorption of about 41 per cent. This, unfortunately, complicates the calculation of percentage amounts of impurity from the iodine absorption equivalents. Most of the adulterated samples, however, have hitherto contained cotton-seed oil in such large quantity, and the iodine equivalent is so high, that a very substantial adulteration can be certified to without taking into account the effect of the beef stearin. When, however, the amount of cotton-seed oil is ascertained by the nitrate of silver test, a near approach to the amount of beef stearin also present can be calculated from the iodine absorption, after making allowance for the influence of the known quantity of cotton-seed oil. If the lard is found to be a mixture of lard and beef stearin or beef fat without cotton-seed oil, the calculation of the proportions of each is simplified; but as at present there are no known means of distinguishing beef stearin from beef fat in lard, it is necessary to calculate from the lower iodine absorption of beef stearin, and thus the amount of beef stearin may be understated. If the iodine absorption of such a lard be found to be 42 per cent, it will be safe to conclude that the lard contains one-half beef stearin and one-half lard, calculating the pure lard iodine equivalent at 61, and that of the beef stearin at 23 per cent, as $61 + 23 \div 2 = 42$.

The Specific Gravity Test is also a useful corroboration of the other tests, for cotton-seed oil is higher in density than lard or stearin. It is customary to take the gravity at a temperature of 210° Fahr. as compared with water at 60° Fahr., and this is best done with a Westphal balance. At 210° Fahr. pure lard has a gravity varying from 0.860 to 0.861, cotton-seed oil is 0.868, and beef stearin 0.857. Lard adulterated with cotton-seed oil is usually comparatively high in gravity. Some adulterated samples which have come under my notice have had a gravity of 0.8635.

Mr. Jones, of Wolverhampton, has suggested in the *Analyst* for September last a qualitative test for cotton-seed oil based on the stiffening effect which such oil imparts to a mixture of lard when sulphur chloride is added to it. This is a useful corroborative test.

Should the lard contain water, this is readily ascertained by the crackling effect produced when a portion of the lard is thrown on a red-hot fire, or into a red-hot platinum dish. Its amount is determined by drying at 212° Fahr. a known weight of the lard in a flat-bottomed straight-sided dish until it ceases to lose weight.

It is satisfactory to be able to state that, in this district at any rate, the cotton-seed oil adulteration of lard is now seldom or never met with. This is owing to the prompt action which the authorities have taken in the matter, and also no doubt to the desire of wholesale dealers to avoid purchasing such lard now that they know of the existence of the adulteration. There are still many samples to be met with which contain very large admixtures of beef stearin and beef fat.—*After J. Soc. Chem. Ind.*, 1889, 30.

Testing the Purity of Reagents.

[Continued from page 44.]

11. *Acidum Sulphuricum purissimum.*

Spec. grav. 1.840. Clear and colorless.

On evaporating 10 Gm. in a platinum vessel, no weighable residue should remain.

Test for Nitric Acid: To 100 Gm. of the acid add one drop of solution of indigo previously diluted with 10 vol. of water, and then add 100 C.c. of water. Even on longer standing the color should not be discharged.

The author has made careful comparative trials of the tests for nitric acid, by means of brucine, diphenylamine, and indigo, and found the latter to be the most delicate. On adding 1 milligramme of absolute nitric acid to 1 kilogramme of sulphuric acid, and testing 100 Gm. of this in the manner directed above, upon addition of 100 Gm. of water the color was completely discharged after a few minutes.

The diphenylamine and brucine reactions are often used when examining drinking water for nitrates, but they give reliable results only when certain conditions are carefully observed.

A. Wagner (*Zeitsch. f. anal. Chem.*, 1881, 329) gives the following directions for the diphenylamine method: Put 1 C.c. of the solution suspected to contain nitrates, or 1 sulphuric acid is to be tested for nitric, put 1 C.c. of pure distilled water into a small porcelain capsule, add a few crystals of diphenylamine, and then add, by means of a platinum spoon holding $\frac{1}{2}$ C.c., two such spoonfuls in succession. The first spoonful causes the diphenylamine to melt, and the addition of the second causes it to be dissolved. If traces of nitric acid are present, a blue color will develop after a while, which soon changes to yellow. In the same manner, a red color is obtained with brucine. The author (Dr. Krauch) has, however, sometimes failed to obtain these reactions, though performing them exactly as prescribed. A deviation from the prescribed method will often lead to other results. A. Vogel, for instance,

* After: Krauch, Dr. C., "Die Prüfung der chemischen Reagentien auf Reinheit," 8vo, Darmstadt, 1888.

reports that he has never yet seen any "pure" sulphuric acid which did not give a rose-red tint with brucine. It seems next to impossible for the manufacturers of pure sulphuric acid to supply a product which will, under all circumstances, stand the brucine and diphenylamine reaction. On the other hand, it may well be demanded that it shall stand the indigo test.

Tests for reducing substances: To 60 C.c. of water add 15 C.c. of sulphuric acid, and one drop of a $\frac{1}{4}$ normal solution of permanganate of potassium (1 C.c. corresponding to 0.0056 Gm. of iron). A distinct red tint should be produced.

Metals. On diluting the acid [gradually] with 5 times its volume of alcohol [the acid to be dropped into the latter], no cloudiness should occur even on protracted standing (abs. of lead).

On diluting 10 C.c. of the acid with water, supersaturating with ammonia, the liquid should neither be rendered greenish by sulphide of ammonium, nor cloudy by oxalate of ammonium (abs. of other metals).

Test for Arsenic: Into a flask of the capacity of 200 C.c., fitted up for Marsh's test, are put 20 Gm. of zinc, absolutely free from arsenic, and then enough of the acid previously diluted with 3 parts of water. No arsenical mirror should be noticeable after half an hour's reaction.

The author adds that sulphuric acid free from arsenic is very commonly found in the market, but acid containing lead and substances oxidizable by permanganate is not of uncommon occurrence.

Test for Ammonia: Dilute 2 Gm. of the acid with about 30 C.c. of water, supersaturate with potassa (3 to 4 Gm.), and then add 10 to 12 drops of Nessler's solution. No distinct yellow or reddish-brown color should make its appearance.

The author states that the presence of 1 milligramme of ammonia in 100 Gm. of the acid, when the before-mentioned test is used, is shown by the development of a yellow color and turbidity.

Test for Halogens: Dilute 2 Gm. of the acid to 30 C.c., and add a few drops of nitrate of silver. No change should occur.

The author states that crude sulphuric acid [referring more particularly to the home product] usually contains arsenic, hydrofluoric acid, lead, iron, titanium, nitric oxide, nitrous and nitric acids, and selenium.

12. Acidum Sulphuricum Fumans ($H_2SO_4 + SO_2$). Fuming or Nordhausen Sulphuric Acid.

An oily liquid, sometimes slightly colored and not quite clear, fuming on exposure to air.

Test for Nitric Acid: To 20 Gm. of the acid are added 4 or 5 drops of diluted indigo solution (1 : 10), and the acid then added to 20 C.c. of water. The liquid must show a distinct blue tint even after some minutes' standing.

The author states that the methods quoted under No. 11—except the indigo method in the form here prescribed—are not applicable to this preparation. It seems that a fuming sulphuric acid standing the indigo test is rather rare. The commercial article usually discharges the indigo color quite rapidly. As the acid is used in mixture with pure sulphuric acid, in Kjeldahl's nitrogen assay, it is necessary to make a blank trial to ascertain the amount of nitrogen compounds present in the acid.

13. Æther Purissimum. Spec. grav. 0.722–0.720. Boiling point: 34–36° C. (93.2–96.8° F.).

It should be colorless, of a neutral reaction, and should not possess a disagreeable odor. On slowly evaporating 50 Gm. of ether, no residue should remain.

If 30 C.c. of ether are poured upon 5 Gm. of pure caustic potassa, and the mixture kept for a few days in a dark place, being occasionally agitated, no brown flakes should separate.

14. Æther Purissimum. Anhydrous, distilled over Sodium (C_2H_5O).

Spec. grav. 0.718–0.720. Boil. point: 34–36° C. (93.2–96.8° F.).

The reactions mentioned under the preceding apply also here. Water agitated with the ether should show neither an acid nor an alkaline reaction.

Absence of Water: Pour 15 C.c. of the ether into an absolutely dry test-tube, and then add a piece of metallic sodium of about the size of a pea. Not more than a very faint development of gas should occur, and the sodium must retain its metallic lustre even after six hours.

In ether which has not been distilled over metallic sodium, this test causes a fragment of sodium to be coated with a distinct yellowish-white coating of sodium hydride.

Note by the Author.—In the literature, the following tests have been proposed to test for the presence of water in ether: 1. Addition of an equal volume of bisulphide of carbon, which should produce no cloudiness (Beilstein). 2. Agitation with dry [completely dried? or air-dry? Dr. K.] tannin, which should remain pulverulent and not become liquid (Hager). 3. Addition of paper rendered blue by cobaltic chloride, which must not change its color (Napier).

The author also tried the addition of anhydrous copper sulphate, which becomes blue or green in presence of water.

The author found that ether having a spec. grav. of

0.725 did not stand any of these tests. "Æther purissimum" (No. 13) stood all but the sodium test. That which was distilled over sodium stood all the tests.

Both kinds of pure ether (Nos. 13 and 14) should be kept protected from the light.

15. Alcohol Methylicum Purissimum (CH_3O).

Spec. grav. 0.796. Boil. point: 64–66° C. (147.2–150.8° F.). Clear and colorless.

On evaporating 50 Gm., no residue should remain.

Test for Acetone: Mix 1 C.c. with about 10 C.c. of soda solution, of double normal strength; then add about 5 C.c. of double normal iodine solution. No cloudiness should occur (Kraemer's method).

On gradually mixing 2 C.c. of methylic alcohol with 2 C.c. of sulphuric acid, no yellow color should be developed.

(Note by the Author.) Methylic alcohol often contains acetone, acetate of methyl, methyl-acetal, aldehyde, propione, and allyl alcohol. Occasionally it is found so much contaminated with acetone that it will yield a considerable amount of iodoform with solutions of iodine and soda.

Ethyl alcohol is detected according to Riel and Ch. Bary (*Compt. rend.*, 82, 768. *Berl. Berichte*, 1876, 638) as follows: Heat the wood spirit with sulphuric acid, add water, and distil. To the distillate add sulphuric acid and permanganate of potassium, afterwards hyposulphite of sodium, and finally a dilute solution of fuchsin. If ethyl alcohol was present, the liquid acquires a violet color.

16. Ammonii Fluoridum Purissimum (NH_4F).

To be tested like Acidum Hydrofluoricum fumans (No. 5, page 44).

The author states that he has found in a specimen of this salt sold as "purissimum" nearly $\frac{1}{4}$ per cent of lead. On heating 10 Gm., a residue of 2 to 3 milligrammes is usually left behind, and is hardly avoidable. But lead should certainly be absent.

17. Ammonii Molybdat Purissimus. ($3(NH_4)_2O, 7MoO_3 + 4H_2O$ or $Mo_2O_3, (NH_4)_2$).

Large, colorless crystals.

Test for Phosphoric Acid: On dissolving 10 Gm. of the salt in 25 C.c. of water and 15 C.c. of water of ammonia (sp. gr. 0.910), a clear solution should be produced. On mixing this with 150 Gm. of nitric acid of sp. grav. 1.200, the liquid, even after standing two hours in a moderately warm place, should not deposit a yellow precipitate.

This test is very delicate. One milligramme of absolute phosphoric acid was added to 100 Gm. of the salt, and when the latter was tested as above directed, a distinct yellow precipitate was produced. At the same time it is just as well to follow the directions usually given, viz.: that after an acid solution of molybdate of ammonium has been prepared for analytical purposes, it be put aside for several days at a temperature of 35° C., so that, if any phosphoric acid is present, it be surely deposited.

17. Argenti Nitras Purus.

Test for Nitrate of Potassium and Chloride of Silver: Dissolve 0.5 Gm. of the salt in 0.5 Gm. of water, add 20 C.c. of absolute alcohol, and shake a few minutes. The solution should be clear.

General Test for Impurities: Dissolve 2 Gm. in about 60 C.c. of water, warm the solution to 70° C., gradually precipitate the silver with the requisite quantity of hydrochloric acid, allow the precipitate to deposit, filter while warm, wash the precipitate, evaporate the filtrate to dryness and ignite it at a low red heat. Only traces of residue should remain.

Note. When exact results are wanted, a larger quantity should be taken in operation. Mr. H. Roessler, of Frankfurt-on-Main, informed the author that he used the following process: 100 Gm. of nitrate of silver are dissolved in distilled water, and the silver precipitated with hydrochloric acid. The filtrate is first concentrated in a porcelain capsule, then again diluted with some water, the liquid warmed and filtered and the filtrate evaporated to dryness. The residue finally remaining is gently ignited over a gas flame, and weighed. At the same time, a volume of distilled water, equal to that used in the preceding operation, is mixed with about 100 C.c. of purest nitric acid (sp. gr. 1.200) and 50 C.c. of hydrochloric acid (sp. gr. 1.190) in a porcelain capsule, the whole evaporated, gently ignited, and the residue weighed. The latter is deducted from the residue obtained from the silver salt.

Detection of Cochineal Color in Foods.

To detect cochineal color (or carmine) in foods, E. Lagorge directs to dissolve the substance in water or dilute alcohol, and if not already slightly acid, to acidify it with 1 or 2 drops of acetic acid, care being taken to avoid a decided excess of acid. The solution is then shaken with amyl alcohol, which extracts the coloring matter. The alcohol is poured off and evaporated with sufficient water on a water-bath. A few drops of a 3% uranium acetate solution are added to the water and a bluish-green color or precipitate shows the presence of cochineal. The addition of an acid gives the solution an orange color. To detect it in wine the latter is shaken with a mixture of equal volumes of amyl alcohol and benzene or, what is better, toluene, otherwise normal ingredients of the wine are dissolved and the action becomes indistinct. After shaking, the alcohol solution is poured off into a test tube and 2

C.c. of distilled water and 1 drop of uranium acetate solution are added and the contents of the tube thoroughly shaken. A bluish green color in the water shows presence of cochineal.

If ammoniacal cochineal has been added to the wine, the color of the lake passes from a violet red to a violet blue. Besides cochineal, some other substances give lakes with uranium oxide. Natural wine gives a yeast color, Campeachy extract gives violet, and Holland wine violet blue. The difficulty in removing the coloring matter from these wines renders the reaction with uranium acetate useless with them.—*Chem. Zeit.* and *J. Anal. Chem.*

On the Reactions, Solubility, etc., of Glass.

An important paper by Dr. F. Mylius, of the Imperial German Bureau of Physics and Technology,* published in the February number of the *Zeitschrift f. Instrumentenkunde*, contains some facts which are but little known or entirely new, and some of which help to account for phenomena often encountered by those who handle much glassware filled with liquid or solid products.

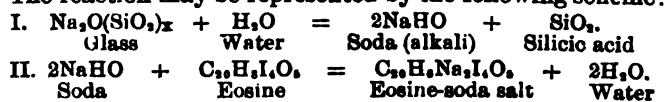
The object of the author's paper was rather an abstract one, namely, to discuss the methods best adapted to determine the technical value of glass.

Heretofore it has been customary to use, for this purpose, Rudolph Weber's process, which consists in exposing the glass in question, during twenty-four hours, to an atmosphere of hydrochloric acid vapors, and afterwards to the air. According to the quality of the glass, the latter will become coated with more or less of a film of chlorides produced by the acid vapor.

While this test is quite reliable when used by a practised eye, it is often uncertain in the hands of less experienced persons. For this reason a color-test, if feasible, would be highly desirable. And, in fact, such a one is subsequently described by the author. He first recalls the fact that certain color tests had been used before. Thus it is known that when powdered glass is added to a red solution of litmus, this will turn blue. In like manner will powdered glass exercise an alkaline reaction upon phenolphthalein and hæmatoxylin, imparting a purple color to a colorless solution of either of these reagents. The author has, however, discovered a new method, by "dyeing" the glass with a peculiar variety of eosine.

The method is based upon the fact that glass is decomposed by water in ethereal solution. It has been shown by Rieth, Weber, and the author that glass has the power of absorbing water from hydrated ether.

The hygroscopic tendency of glass is in direct proportion to its proneness to suffer decomposition. A piece of glass placed in hydrated ether absorbs the more water the poorer it is. The quantity of alkali which is thereby set free or capable of reaction may be used as a measure of decomposition, and may actually be measured colorimetrically by converting it into a colored salt by means of eosine (which is an acid). If the eosine is contained in the ethereal solution, a portion of it is deposited in the glass, and the quantity is equivalent to the amount of the alkali. The reaction may be represented by the following scheme:



It has been found that the following method is most suitable in practice:

Saturate commercial ether at the ordinary temperature with water by agitation, remove the ethereal layer, and in 100 C.c. of it dissolve 0.1 Gm. of iodine-eosine. Filter the solution and preserve it in well-closed bottles [of hard glass]. It will keep for any length of time.†

When glass is to be examined colorimetrically, pieces of it are laid in the solution, or the latter is poured into tubes or vessels made from it.

Every kind of glass becomes coated, by protracted exposure to the air, with more or less of a layer of decomposition products, chiefly carbonates of alkalis. Before applying the test, this must be carefully removed by washing with water, alcohol, and ether.

When the test is performed, and the varieties of glass to be tested are available in shape of tubes, a series of these are cleaned as just described, then fused up at one end, and a quantity of the colored reagent poured into each. They are then hermetically sealed and set aside for twenty-four hours, when the liquid is removed and the tubes rinsed out with pure ether.

The eosine solution used has a bright orange-red tint, and the colored coats produced in glass-tubes of different quality vary from a pale purple orange, through pale purple, pink, and reddish, to perfect colorlessness, according to the quality of the glass.

The soft kind of glass, such as that containing lead (crystal glass), assumes the most deep purplish tint of all. The more difficultly fusible kinds, which are generally

known as "hard glass" (Bohemian), become much less tinted. The most resistant of all Bohemian kinds of glass is that made by Kavalier, which is scarcely tinted at all. Good qualities of bottle glass as well as window glass are likewise scarcely affected by the eosine solution.

Testing the Purity of Creosote.

In view of the increased importance which creosote has recently acquired in medicine, W. Brandes, of Hanover, reviews some of the pharmacopœial and other tests which have been relied upon for recognizing its purity, and makes some suggestions for their improvement.

The German Pharmacopœia allows the specific gravity to vary between 1.030 and 1.080 (the U. S. Pharmacopœia, between 1.035 and 1.085). This appears to be too large a variation. The caustic soda test of the Germ. Pharm. (which is not used by the U. S. Pharm.) is thus modified by the author, after Hartmann and Hauers:

Mix 4 C.c. of water, 4 C.c. of solution of soda (15%), and 2 C.c. of creosote. The resulting liquid must be perfectly clear and of a light yellow color. Any turbidity would indicate the presence of indifferent oils, and a brown color would show that other constituents of coal-tar are present.

Creosote is mainly composed of guajacol and cresol.* Pure guajacol has the spec. grav. 1.117 at 15° C.; pure cresol, the spec. grav. 1.089 at 13° C. From this it follows that a good creosote should have a high spec. grav. Now, as the value of a creosote should depend upon the percentage of the above two bodies contained in it, and more particularly the former, a test should be applied which permits their estimation. This may be done by adopting the method of Hlasiwetz, depending upon the fact that both guajacol and cresol form potassium salts which are difficultly soluble in alcohol. To execute the test, prepare a solution of 50 Gm. of caustic potassa (purified by alcohol) in 200 Gm. of pure alcohol of 96% Tralles. Then agitate 10 C.c. of this solution with 1 C.c. of creosote. If the latter is rich in the two bodies mentioned, it will quickly solidify to a crystalline mass.

Mr. Brandes recommends the insistence upon a spec. grav. of at least 1.070 to 1.080, in order to insure the rejection of products containing but little of the important ingredients.

Regarding the collodion test of the pharmacopœia, the author says that care should be taken not to use collodion having an acid reaction, and to use a perfectly dry test-tube.

The glycerin test is very reliable, any phenol present being readily shown.

The author also mentions a test recommended by Hartmann and Hauers, which is as follows:

On shaking 2 C.c. of creosote, 4 C.c. of petroleum benzin, and 4 C.c. of a cold saturated solution of caustic baryta together, the benzin solution should not acquire a blue or muddy color, and the aqueous portion should not become red. Either coloration would show that other (objectionable) constituents of beechwood-tar are present.

When this test is applied to different samples of creosote, it will be found that the mixture finally separates, either in three layers: baryta solution, creosote, benzin; or in two layers: baryta solution, and solution of creosote in benzin. This different behavior is thus accounted for: Pure guajacol is insoluble in benzin, but pure cresol is soluble in this menstruum. When there is a certain proportion of both present, the cresol will aid the partial solution of guajacol. But when the latter materially predominates, or when the creosote contains phenol or cresol, the guajacol is not dissolved at all, and remains, mixed with the phenol or cresol, as a separate layer.

The author recommends to make the test with alcoholic potassa, which is mentioned above, officinal in about the following form:

On agitating 10 C.c. of alcoholic solution of potassa (prepared by dissolving 1 part of potassa purified by alcohol in 4 parts of pure alcohol of 96%), with 1 C.c. of creosote, the mixture should congeal, after a while, to a firm, crystalline mass, which should become, after half an hour's standing, so firm that it cannot be disturbed even by strong agitation.—After *Archiv d. Pharm.*

Poisoning by Citrate of Caffeine.—Mr. T. Geraty, M.R.C.S., of Nottingham, describes a case of poisoning by caffeine, the sufferer being a lady, who took a dessert-spoonful (equal to 200 grains) of pure citrate of caffeine in mistake for the granular effervescent form of the drug. A quarter of an hour after the reception of the poison there was semi-unconsciousness, grave depression, extreme pallor, all the muscles completely relaxed, and a decided inclination to sleep; pulse slow, soft, and very compressible; respiration slow and sighing. Emesis was induced by apomorphia and stimulants administered, but it was more than one hour before consciousness was recovered and the faintness passed away.—*Chem. and Drugg.*

* Physikalisch-Technische Reichsanstalt (charged with the inspection and verification of standards of weight, measure, light, sound, heat, etc.).

† Ordinary eosine is a bromated substitution-product of fluorescein, and that which is soluble in water and used for red inks is usually the sodium salt of this body. This kind of eosine will not answer the above purpose. Bromated fluoresceine (not combined with a base) may be used, but the iodated compound is preferable, on account of the finer color. Iodine-eosine is to be had in the market, for instance, from C. A. F. Kahlbaum, of Berlin.

* Guajacol is the methyl-ether of pyrocatechin— $\text{OH.C}_6\text{H}_3\text{OCH}_3$. Cresol is the methyl-ether of homo-pyrocatechin— $\text{OH.C}_6\text{H}_4\text{(CH}_3\text{).OCH}_3$.

Cresol must not be confounded with cresol, which is a generic name for three isomeric bodies (difficult to separate) contained in coal-tar, and also in certain wood-tars, and which have the composition $\text{OH.C}_6\text{H}_4\text{OH}$. Beechwood-tar contains both cresol and cresol.—Ed. AM. DR.

Ointment for Burns.

Iodoformi.....	80 p.
Ext. Conii.....	40 p.
Acid. Carbolic.....	1 p.
Unguenti.....	600 p.

—Med. Press.

Injection Brou.

Opil,	
Catechu.....	55 gr. viies.
Croci.....	gr. xv.
Aque,	q. s. ad fl. 3 ij. .
Et adde	
Plumbi subacetatis.....	gr. xxiiss.
Zinci sulphatis.....	gr. xlv.

—Gallard.

Almond Meal.—Blanched sweet almonds, ripe and dry beans, of each 18 oz.; orris root, 8 oz.; white Castile soap, 6 oz.; spermaceti, 1½ oz.; dried carbonate of sodium, 1 oz.; oils of bergamot, lavender, and lemon, of each 6 drachms. Beat or grind to a fine powder, and keep from the air. To be used with a little water, in place of soap, to clean, whiten, and soften the skin.—*Dr. Cir. after Cooley.*

Espey's Cream.—The following is said to produce a mixture resembling this preparation:—Quince seed, 1½ drachms; boracic acid, 4 grains; glycerin, 2 fl. oz.; alcohol, 3 fl. oz.; carbolic acid, 10 grains; cologne water, 2 fl. drachms; oil of lavender, 20 drops; glycerite of starch, 2 oz.; water, sufficient to make 1 pint. Dissolve the boracic acid in 8 fl. oz. of water, macerate the quince seed in this for three hours, and press through a cloth; add the glycerin, carbolic acid and glycerite of starch, and mix thoroughly; mix the cologne water and oil of lavender with the alcohol, and add to the mucilage, mixing the whole well.—*Dr. Cir.*

Bituminated Iodoform is a compound of iodoform and tar lately introduced as an antiseptic by Dr. Ehrmann, of Vienna. It is in the form of transparent, brown, metallic scales, easily pulverized, and is thought to diminish the volatility of the iodoform.

Camphorated Naphthol.—Crystallized carbolic acid is liquefied when mixed with an equal weight of camphor, and this property has been utilized in forming a liquid to be used as a painless cautery. Mr. Duquesnelle says that both alpha- and beta-naphthol possess similar properties, a mixture of ten parts of the latter with twenty parts of camphor producing a syrupy, colorless liquid, insoluble in water, but miscible in all proportions with fixed oils. To insure rapid solution, the substances must first be finely powdered.—*Pharm. Jour.*

Goose-grease is recommended by Percy Wells as a basis for ointments. It should be mixed with cocoa-butter, and in this form is very readily absorbed. Mr. Wells melts 3 pounds in an enamelled pan. When the small amount of membrane it contains forms a mass, it is to be strained through fine muslin and, while hot, ½ pound of cocoa-butter is added. The mixture is then to be stirred more and more vigorously as it cools, a wooden spoon being preferable to a knife or rod for this purpose. By being benzoated, it may be kept for a long time without change.—*Pharm. Jour.*

The Largest Scale in the world is said to be that which has recently been completed in Krupp's steel-works at Essen. Its load-capacity is 100,000 kilos (nearly 100 tons). The fee for its official verification and "sealing" amounted to 111 mark and 50 pfennige.

Fertilizer for House Plants.—It is reasonable to suppose that plants grown in the house may require the use of fertilizers quite as urgently as plants grown out of doors, if, indeed, the need is not more urgent, owing to the artificial life which they lead, and the deprivation of surroundings which nature furnishes. The cultivation of house plants is sufficiently common to warrant the attention of druggists to this want, and we give below a formula for a fertilizer which can be sold in packages to be added to the requisite proportion of water:

Carbonate of Potassium, Phosphate of Potassium, Carbonate of Magnesium, Silicate of Sodium, of each 1 part; Nitrate of Potassium, 2 parts; Sulphate of Iron, 3 parts. To be added to 2,000 parts of Water.

Treatment of Phthisis by Hot Air.—When Dr. Weigert published his results in the treatment of phthisis by inhalation of hot dry air, a good deal of scepticism was excited in the scientific world, and Weigert was not able to bring the details of his cases before the medical society to which he had intended to communicate them. Prof. Kohlshütter, of Halle, read a paper the other day before a medical society in which he confirmed the theoretical exactness of Weigert's announcement by stating that air heated to 350° F. could be inhaled by phthisical patients without any bad effects, while the influence of the inhalations on the tubercle bacillus seemed to be really destructive. The professor considers that the treatment is worthy of serious examination—a testimony which created no small sensation among his audience.—*Chem. and Drugg.*

A New Tonic.—M. Thiel has examined the bark of a tree known as the "moussena," the *Acacia anthelmintica* of Baillon, growing principally in Abyssinia, and having a high reputation as a destroyer of tapeworm. It is said to be more active than kousso and to have a less disagreeable taste. The bark is the only part of the tree employed medicinally, and this is taken in the form of powder, in doses of from 1 oz. to 2 oz., alone or mixed with honey and stirred up in milk. The Abyssinians mix the powder with flour, and make bread with it, and take a sufficient quantity of the bread with butter or honey three hours before the first meal in the morning. The same evening or the next day the worm is generally expelled in fragments. M. Thiel has found in the bark a substance whose chemical characteristics resemble saponin, and he calls this "moussanine."—*J. de Med. de Par. and Chem. News.*

Morrhual.—Morrhual is being pushed forward. The process of manufacture consists, it seems, in extracting cod-liver oil with alcohol (90 per cent), and distilling the extract. The residue is a sharp-tasting, very bitter aromatic oil, which contains bromine, iodine, and phosphorus in some quantity, and which crystallizes at normal temperatures. The product is put up in capsules of 3 grains each, which are declared to correspond in therapeutical virtue to about 1½ drachms of cod-liver oil. Brown oil is said to yield from 4.5 to 6 per cent, pale oil 2.5 to 3 per cent, and white oil 1.5 to 2 per cent of morrhual.—*Chem. and Drugg.*

Salol in Cholera.—MR. ERNEST HART (editor of the *Brit. Med. Jour.*), on his recent visit to Paris, called at the private pathological laboratory of Professor Cornil, and among those working in the laboratory he found M. Lowenthal, of Lausanne, who was studying the action of salol on the comma microbe of cholera, and who insisted on the toxic influence of this substance on cultivations of the cholera bacillus previously revived, and rendered very toxic by the action of pancreas, pancreatic juice, or pancreatin. When two tubes are taken, both containing a nutritive mixture to which pancreatic juice has been added, and also cholera bacillus cultivations, if to one be added a quantity of salol exceeding 10 centigrammes, the vegetation of the cholera *bouillon* was immediately arrested. According to the conclusions which he is disposed to draw from this research, salol may possibly become the preventive and curative agent of Asiatic cholera, but it must be tried in clinical practice before this conclusion can be definite.—*Chem. and Drugg.*

Use of Antipyrin or Antifebrin.—Many medical writers have reported the efficacy of both antipyrin and antifebrin in headache. The best method of administration, according to Dr. Carter and others, appears to be to give 5 grains (of either) every hour, until the pain begins to moderate. A relief is usually experienced after the first, but certainly after the second dose. It has, however, been noticed that the continued administration of antipyrin produces in some person a weakness of the heart's action, and for this reason Dr. Carter and some other authorities usually prefer antifebrin.

The Cod-Liver Oil Fisheries of Norway.—The continuous stormy weather during the whole fishing season of 1888 (between January and April) prevented the Lofoten fishing-boats from going out, and had it not been that fish ran into a small fjord named Ostnaesfjord, near Brettesnaer, it would have been one of the worst fishings for some years back. As soon as it was found that the fish had gone into this fjord, several thousands of boats flocked thither, with the result that in five weeks they took about 18,000,000 fish, bringing up the total number taken on the inner side of the Lofoten to 29,500,000, against 31,000,000 the previous year.

A Prize for Alkaloidal Assay-Methods.—The Belgian Academy of Medicine has, among other prize subjects of purely medical interests, proposed the following which concerns the pharmaceutical chemists: "To indicate from deductions based on personal and original investigations a precise and easy method for estimating alkaloids in medicaments and pharmaceutical preparations." The prize offered is 500f. Memoirs must be sent before December 15th, 1889, and bear no designation but a motto which is to be repeated on a sealed envelope containing the name of the writer. The essays may be written in either Latin, French, or Flemish. No work already published in whole or in part is to be admitted to the competition.—*Chem. and Drugg.*

Picrotoxin an Antidote to Morphine.—Messrs. Böhringer & Sons call attention to interesting preliminary experiments made by Professor Arpad Bokai which go far to show that picrotoxin, the active principle of *Cocculus indicus*, is probably the best antidote for morphine poisoning. Picrotoxin is said to prevent paralysis of the centre of respiration, by which death from morphine is caused. It has also exactly the opposite effect of morphine on the pressure of blood. Professor Bokai has promised further communications on this subject.—*Chem. and Drugg.*

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WHOLE No. 178.

FREDERICK A. CASTLE, M.D. EDITOR.

CHARLES RICE, Ph.D. ASSOCIATE EDITOR.

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EDITORIAL.

IN an editorial contained in our last November number, page 216, we threw out a hint, or rather warning, to our European confrères, who are just awakening to the importance of *fluid extracts*, not to devise new methods or new apparatus for making these preparations, but to employ those which we, on this side of the Atlantic, have found, after nearly forty years' trial, to be most suitable. If our confrères, after such trial, could evolve anything better, we should be only too glad to adopt it. But we were then, and are now even more, convinced that the disregard of our hard-gained and minutely recorded experience, accessible in our literature, would eventually entail much disappointment upon our Continental brother-pharmacists.

We have recently seen an illustration and description of a new percolating apparatus designed by the well-known firm of Schlag & Berend, of Berlin, which bids fair to make the user obtain but a poor opinion of the value of fluid extracts. It consists of a glass percolator, containing a glass diaphragm (fused in) and a glass stop-cock. It is connected by means of glass and rubber tubing with the receiver, which is a Woulff's bottle having a tubulure at the bottom. Cumbrous and complicated as this apparatus is, it might yet be made serviceable by proper management. But the accompanying directions utterly destroy its utility. Among these directions are the following:

"When the apparatus is to be used, put the drug in coarse [!] powder into the percolator, and dampen it with the menstruum, the stop-cock being closed. Connect the other parts of the apparatus, and having caused enough of the menstruum to flow on top, allow to macerate for three days. Now open the glass faucet of the percolator, and allow the percolate to flow off, with suitable regulation of pressure [by means of a reservoir, which we need not describe here]. It is of advantage either to pour back the first percolate so as to pass it through the drug again [!], or at once to evaporate it. When the percolate amounts to four-fifths of the weight of the drug, the operation is continued with fresh menstruum until the drug is exhausted," etc.

It would be difficult to devise a process more thoroughly faulty, or more surely resulting in failure, than this. It

seems our confrères are bound to run the gauntlet of experimentation themselves, without benefiting by the experience previously gained by others. Well, we can only look on and wait, remembering that a wilful man must have his way.

ATTENTION is called to the fact that the "Digest of Criticisms on the United States Pharmacopœia, Sixth Decennial Revision (1880)," part I., which has been published by the Committee of Revision, is now off the press and ready for distribution to those who are entitled to receive it under the resolution of the Committee. As the pamphlet is *not for sale*, and has been printed at the expense of the Committee for the purpose of assisting those who are actually engaged in work preparatory to the next revision, or who are members of Pharmacopœia Committees, it will be well to quote the following Notice from the pamphlet, as there are already indications that some persons desire the publication merely as a literary curiosity, to be put on their shelves perhaps among "privately printed books," without really intending to make use of it. The number of legitimate applicants is likely to be large enough to exhaust the edition in a short time. Care will therefore be taken not to bestow copies where it will be almost certain that they will be of no use to the revisers of the pharmacopœia.

The Notice above referred to is as follows:

1. An official copy of this Digest will be sent to all incorporated Medical and Pharmaceutical State Associations, Societies and Colleges, and to similar institutions and bodies, as far as their existence or location is known.

2. Additional copies may be obtained by any of these bodies, for the use of any Committee on Pharmacopœia, by forwarding the amount of postage, which is 8 cents per copy.* Not more than five copies can be thus obtained at first; but if the number remaining in stock permits, more may afterwards be supplied.

3. Each member of the Committee of Revision will receive five copies.

4. Copies may be sent, free of postage, to such individuals as are known to be engaged in pharmacopœial work, and whose names are furnished to the Chairman.

5. Copies sent to individuals at their own request, will *not* be sent carriage-free. The amount of postage (8 cents) must accompany the request.

6. Every recipient of this pamphlet is requested to send to the Chairman of the Committee the titles of any publications which may be known to him to contain valuable and *positive* contributions to the next revision of the U. S. Ph., and which have not been already abstracted for Part I.

* This was the estimated postage before the pamphlet was bound. The actual postage was 7 cents.

It may be stated here that while the resolution under § 1 distinctly specifies "incorporated bodies," in deference to the fact that only the latter are (with special additions) represented in the decennial pharmacopœial convention, yet copies of the pamphlet will be also placed at the disposal of non-incorporated bodies, if actively engaged in pharmacopœial work, so far as the copies on hand will permit.

Part II. is nearly ready for the press, but will be held back for about one month, in order that correspondents may indicate the titles of journals or works not yet made use of. It should be understood that no blame should attach to the Committee for having failed to use any source of information which has not been pointed out to them as deserving of notice.

WE are much pleased with the sensible course adopted by the Commission of Pharmacy for the State of Maine, as illustrated by the circular letter which we print elsewhere in this number. Such a frank and reasonable effort to aid candidates for a license to practise pharmacy should find many imitators among other State boards. It is likely to impress every prospective applicant with the belief that while the board intends to enforce the law regulating the practice, it is fairly disposed towards all who are possessed of the essential matters of information which are requisite, and that no one who will take the trouble to inform himself of things which every pharmacist should know needs to fear the ordeal to which he will be subjected.

EXHIBITORS at the American Pharmaceutical Association in San Francisco on the 24th of June next are requested to communicate without delay with Prof. E. W. Runyon, the local secretary, at 53 Stevenson street, San Francisco, Cal. As this is to be the first meeting of the association on the Pacific coast, a special effort is being made to render it very attractive, and to include in the exhibition whatever is of interest to druggists.

Correction.

In the paper by Edo Claassen, on "Improvement in Filter Papers," quoted in our last number, page 51, from the *American Journal of Pharmacy*, the word *centimeters*, in the text and the illustrations, had better be read *millimeters*, according to a note by the author in the succeeding number of the A. J. A. [Of course, it makes no difference, which of the two denominations of measure is chosen. Looking at the size of the illustrations, millimeter might perhaps be more appropriate.] Mr. Claassen also states that it will be advantageous in many cases to again fold the narrow strip (indicated in the figures by dotted lines) by bringing its lower end, commencing at the angle, over to the inner crease, thus forming a small triangle; and in case the neck of the funnel should be unnecessarily large, he recommends to support the filter in a cone of writing paper, folded like a plain filter, but having the point cut off sufficiently to permit the lower end of the filter to project beyond the aperture.

College of Pharmacy of the City of New York.—The annual election of officers was held on Thursday, March 21st, at the College building, 209-211 East 23d street. The following were elected:

President: Ewen McIntyre.

Vice-Presidents: H. J. Menninger, George C. Close, W. L. Vennard.

Treasurer: David Hays.

Secretary: J. N. Hegeman.

Trustees, to serve for three years: B. F. McIntyre, S. J. Bendiner, Emlen Painter, Chas. F. Schleussner.

The examination of the two classes takes place from April 1st to 5th, and the Commencement will be held on Tuesday, April 16th, 7:30 p.m., at Steinway Hall.

Attention is called to the fact that the Summer Course in Practical Botany, combined with botanizing excursion, under Prof. Schrenk, begins on April 10th.

American Medical Association.—This association meets on the 25th to 28th of June, inclusive, in Newport, R. I., and H. R. Storer, M.D., Chairman of the Committee of Arrangements, invites applications for spaces in the exhibition. As the room to be devoted to an exhibit is somewhat limited, an early application is rather essential, and the applicant should state the nature of the proposed exhibit. Address Dr. Charles A. Brackett, Newport, R. I.

Botany in the College of Pharmacy.—The lectures to the summer class in *Practical Botany* at the College of Pharmacy of the City of New York will commence on Wednesday, April 10th, at 4.30 p.m., and will be continued every Wednesday until the end of June. This course, in which botanical excursions are included, is open to all (ladies as well as gentlemen) who desire to be instructed in the science of botany. The attention of prospective pharmaceutical students is particularly directed to this opportunity to become initiated into an important branch of their curriculum. The course in microscopic botany will begin on Thursday, April 11th, at 7.30 p.m. Thorough individual instruction will be given to a limited number of ladies and gentlemen in all the more important microscopical manipulations. Particulars may be obtained by applying to the clerk of the college, 209-211 E. 23d St., or to Prof. Jos. Schrenk, at Hoboken, N. J.

Louisiana Board of Pharmacy.—A letter from Mr. R. N. Girling, of New Orleans informs us that at the last meeting of the State Board of Pharmacy, 573 applications had been received for registration under the law approved by the Governor on the 11th of July, 1888. The board consists of A. N. Girling (chairman), A. K. Finlay, and R. L. Iler. Mr. F. C. Godbold, cor. Magazine and Thalia sts., is the secretary, and written examinations are held on Pharmaceutical Chemistry, *Materia Medica*, Toxicology, Practical Pharmacy, Adulteration of Drugs, Reading and Compounding Prescriptions, Doses, and such other subjects as may be deemed expedient by the committee.

Philadelphia College of Pharmacy.—186 pupils received the degree of Graduate in Pharmacy on the 19th of March (68th Annual Commencement); one of the number was a woman, named Emma Bour Nardyz. The following prizes were awarded: Certificate of proficiency in Chemistry, to H. J. M. Schroeder, Ph.G. The PROCTOR PRIZE of a gold medal and certificate for highest grade of scholarship and meritorious theses, to F. B. Quackenbush, Messrs. H. V. Arny, G. A. Krauss, E. S. Reeder, J. H. Small, C. M. Southall, and J. L. Weill were distinguished, and J. Calvin, G. A. Dietz, Jr., H. R. Gillespie, R. A. Hotchis, H. V.

Haak, I. F. Kilgus, H. Kraemer, and G. H. Ray were meritorious. The H. C. LEA PRIZE of \$100, for the best thesis was won by H. Kraemer. The MATERIA MEDICA PRIZE (a Zentmayer microscope) for original histological work on American plants, went to H. Kraemer, with honorable mention of H. V. Arny and G. H. Ray. The PHARMACY PRIZE (gold medal) for original pharmaceutical work, to F. B. Quackenbush, with honorable mention of C. D. Kingston and S. E. Howell. The CHEMICAL PRIZE (chemical balance) to G. A. Krauss, for original quantitative analysis, with honorable mention of G. A. Deitz, Jr., F. V. Cassaday and J. L. Weill. The ANALYTICAL CHEMICAL PRIZE (\$25) for original work, to F. B. Quackenbush. The JAMES S. ROBINSON PRIZE gold medal and certificate chemistry and analytical chemistry, C. M. Southall. The JOHN M. MAISCH PRIZE (\$20) for histological knowledge of drugs to Augustus Bradley, with honorable mention to a number of competitors. The OPERATIVE PHARMACY PRIZE to W. B. Crawford, Jr. The THEORETICAL PHARMACY PRIZE, to E. S. Reider.

Ohio Pharmaceutical Association.—The eleventh annual meeting will be at Mansfield, Ohio, June 4th, 5th and 6th. Ample arrangements have been made for the exhibition in a hall 67x77 feet, which also serves as the ante-room to the meeting hall. E. H. Lindsey is the Local Secretary (to whom all inquiries relative to the facilities for exhibiting goods should be addressed), and W. M. Barton, Dr. A. H. McCullough, and F. B. Grove are the Committee on Exhibit.

Cincinnati College of Pharmacy.—The annual commencement was held on the 14th of March, in the Musik Verein Hall and the following-named gentleman were made alumni: A. Bauer, R. S. Burnett, L. C. F. Cramer, C. Fleischmann, C. Fredricks, Jr., W. F. Fuldner, H. H. Grothaus, H. Herr, A. A. Krieg, M. Metzger, G. J. Mitchell, J. W. Morford, V. C. Muehlberg, H. Nippert, A. F. Schmidt, W. V. Skillman, H. W. Stegemiller, L. C. Widrig. A ball followed the graduating exercises, when the company danced to such music as Castor-oil Lanciers, Creosote Polka, Flaxseed Quadrille, Rochelle Schottische, Paregoric Waltz, etc.

American Pharmaceutical Association.—E. W. Runyon, the Local Secretary of the Association, invites correspondence relation to the exhibition which will be coincident with the meeting. His address is 53 Stevenson street, San Francisco, Cal.

Pennsylvania Pharmaceutical Association.—The next meeting will be held in Scranton, June 4th, instead of June 11th, as announced. This is to enable those who desire to do so to attend the meeting of this association as well as that of the Amer. Pharm. Assoc. in San Francisco.

The Croatian Pharmacopoeia.—The first edition of an Croatian Pharmacopoeia was published on the first of January, and corresponds very closely to the Hungarian Pharmacopoeia.

A NEW edition of the Pharmacopoeia Neerlandica will soon appear, the manuscript having been completed and placed in the hands of the Minister of the Interior.—*Pharm. Jour.*

Season Tickets for the Paris "Exhibition."—An official notice just published sets forth that season tickets will be issued at 100f. to the public, and 25f. to members of committees. Applicants are to give two of their photographs, card size, one of which will be returned with the receipt on the back, and will form the admission ticket. Foreigners may send the money to the Minister of Finance, "*Caisse centrale du Trésor*," by post-office order, in a registered letter, together with two of their photos, and 10 cts. extra for revenue stamp and return postage. They will receive by mail a receipt, against which, on coming to Paris, they will be handed their admission ticket. Members of committees must add official documents establishing their position.—*Chem. and Drugg.*

CORRESPONDENCE.

Pharmaceutical Excursion to the Paris Exposition.

SEVERAL pharmacists of my acquaintance, in conversation or by letter, having expressed regrets that the California excursion of the A. P. A. had been arranged at a season of the year inconvenient for them to leave, it has been suggested that an effort be made to arrange a party to visit the Paris Exposition leaving about July 20th, to be gone from thirty to thirty-five days, allowing from two to three weeks in Europe. Inquiries have elicited the fact that a party not to exceed forty can do this, allowing seven to ten days in Paris and three to five in London, for a sum not exceeding \$200, by taking second cabin on the French line of steamers, which are unexcelled in every respect by i he

transatlantic fleet. Friends who have travelled second cabin by this line say that in the way of comforts as regards state-rooms and table, to a company travelling together, it is all that could be desired. The first cabin would cost about \$75 additional. Rooms and guides could be secured in advance. For about \$25 additional, a trip down the Rhine could be arranged. Those desiring to extend their stay could do so. In order to secure accommodations, it would be necessary to have names booked not later than June 15th. Further information furnished on application.

Boston, March 18th, 1889.

J. W. COLCORD.

Seventh Decennial Convention for Revising the Pharmacopœia of the United States of America.

NOTICE is hereby given that, in accordance with and by virtue of the authority vested in me by the Convention of 1880, I hereby call upon the several incorporated Medical Societies, incorporated Medical Colleges, incorporated Colleges of Pharmacy, and incorporated Pharmaceutical Societies throughout the United States of America, The American Medical Association, and The American Pharmaceutical Association, to elect a number of delegates, not exceeding three, and upon the Surgeon-General of the Army, Surgeon-General of the Navy, and the Surgeon-General of the Marine Hospital Service to appoint, each, not exceeding three medical officers to attend a General Convention for the Revision and Publication of the Pharmacopœia of the United States of America, to assemble in the city of Washington, D. C., on the first Wednesday of May, 1890 (May 7th), at twelve o'clock noon.

The several bodies, as well as the Medical Departments of the Army, Navy and Marine Hospital Service, are hereby requested to submit the Pharmacopœia to a careful revision, and to transmit the result of their labors to the Committee of Revision at least three months before the meeting of the General Convention.

The several Medical and Pharmaceutical bodies are hereby requested to transmit to me, as the President of the Convention of 1880, the names and residences of their respective delegates, as soon as they shall have been appointed; a list of these delegates shall thereupon be published under my authority, for the information of the medical public, in the newspapers and medical journals in the month of March, 1890.

In the event of the death, resignation or inability of the President of the Convention of 1880 to act, these duties (in accordance with the Resolution of that Convention) shall devolve, successively, in the following order of precedence, upon the Vice-Presidents, the Secretary, the Asst. Secretary, and the Chairman of the Committee of Revision and Publication of the Pharmacopœia.

These officers are as follows: *First Vice-President*, Samuel C. Bussey, M.D., of Washington, D. C.; *Second Vice-President*, P. W. Bedford, Ph.G., of New York; *Secretary*, Frederick A. Castle, M.D., of New York; *Assistant Secretary*, C. H. A. Kleinschmidt, M.D., of Washington, D. C.; *Chairman of Committee of Revision*, Charles Rice, Ph.D., of New York; *First Vice-Chairman of the Committee of Revision*, Joseph P. Remington, Ph.M., of Philadelphia, Pa.; *Second Vice-Chairman of the Committee of Revision*, C. Lewis Diehl, Ph.G., of Louisville, Ky.

At the General Convention held in Washington, D. C., on the fifth day of May, 1880, the organizations and bodies enumerated in the Abstract of the Proceedings of the National Convention of 1880, on pp. xv. to xviii. of the U. S. Pharmacopœia of 1882—a list of which will be found appended to this call—were recognized as being entitled to representation.

If any body other than those admitted in 1880 shall desire a representation in the Convention of 1890, it is suggested that the proof of incorporation, signed by the Secretary of State of the State which shall have issued the charter, or by properly qualified public officials of the United States, be presented with the credentials of the delegation.

A blank form of certificate of appointment of delegates will be sent upon application by letter to my address, care of Dr. Edwin H. Brigham, Assistant Librarian of the Boston Medical Library, 19 Boylston Place, Boston, Mass.

ROBERT AMORY,

President of the Convention of 1880.

Boston, March 9th, 1889.

List of Incorporated Bodies and of Government Departments represented in the Pharmacopœial Convention of 1880.

Connecticut Medical Society; Iowa State Medical Society; Massachusetts Medical Society; Medical Society of the State of New York; Medical Society of the State of North Carolina.

College of Physicians and Surgeons in the City of New York; College of Physicians, Philadelphia; Medical and Chirurgical Faculty of Maryland; Medical Society of the District of Columbia; New York Academy of Medicine; Philadelphia County Medical Society.

Albany Medical College, Med. Dept. of Union University, Albany, N. Y.; Bellevue Hospital Medical College, New York; College of Medicine, Syracuse University, Syracuse,

N. Y.; College of Physicians and Surgeons, Med. Dept. of Columbia College, New York; Dartmouth Medical College, Hanover, N. H.; Department of Medicine and Surgery of the University of Michigan, Ann Arbor; Jefferson Medical College, Philadelphia, Pa.; Medical College of Indiana, Med. Dept. of Butler University, Irvington, Ind.; Medical Department of Howard University, Washington, D. C.; Medical Department of Iowa State University, Iowa City; Medical Department of the University of Georgetown, Washington, D. C.; Medical Department of the University of Maryland, Baltimore; Medical Department of the University of Pennsylvania, Philadelphia, Pa.; Medical Department of the University of Virginia, Charlottesville, Va.; Miami Medical College, Cincinnati, O.; Missouri Medical College, St. Louis; National Medical College, Med. Dept. of Columbian University, Washington, D. C.; Rush Medical College, Chicago, Ill.; University of the City of New York, Med. Dept., New York; Woman's Medical College of the New York Infirmary, New York; Women's Medical College of Pennsylvania, Philadelphia, Pa.

Chicago College of Pharmacy, Chicago, Ill.; Cincinnati College of Pharmacy, Cincinnati, Ohio; College of Pharmacy of the City of New York, N. Y.; Louisville College of Pharmacy, Louisville, Ky.; Maryland College of Pharmacy, Baltimore, Md.; Massachusetts College of Pharmacy, Boston, Mass.; National College of Pharmacy, Washington, D. C.; Pennsylvania College of Pharmacy, Philadelphia, Pa.; Philadelphia College of Pharmacy, Philadelphia, Pa.; St. Louis College of Pharmacy, St. Louis, Mo.; University of Michigan, School of Pharmacy, Ann Arbor, Mich.

Medical Department of the U. S. Army; Medical Department of the U. S. Navy; U. S. Marine Hospital Service.

Examinations by the Maine Board of Pharmacy.

To the Pharmacists of Maine:

APPEALS have often been made to the Commissioners of Pharmacy for copies of the questions to be asked at an examination, or at least for some indication as to the direction and range of the questions. The first of these requests cannot, for obvious reasons, be complied with. As to the second, when we consider the portentous volume of the text-books, the overwhelming multitude of details contained in them, the hopelessness of memorizing more than a minute fraction of their contents, and the aimless and discouraging wandering of a student in search of probable subjects for examination, the wish expressed seems only reasonable. Impressed with this conviction, the Commissioners have decided on giving some suggestions for a course of reading as a preparation for the questions which may be contained in the question paper next to be formulated. In order to afford time for the prescribed course of reading, the question paper prepared in August, 1888, will be employed in examinations for the most part, and perhaps all of the current year, and the new Question Paper will be prepared in season for the February examination of 1890. But the course of reading prescribed will be of advantage in aiding to answer the questions now in use.

In *Materia Medica*, then, we shall ask some questions about the remedies which have been made official within the last ten years. *Examples:* Acid Boric, Acid Hydrobromic, Acid Oleic, Acid Salicylic, Auri et Sodii Chloridum, Caffeina, Camphora Monobromata, Chrysarobinum, Erythroxylon, Eucalyptus, Glycyrrhizinum Ammoniatum, Guarana, Lithium, Physostigma, Pilocarpine, Thymol, Viburnum. A more complete catalogue will be found in the Pharmacopœia of 1880 (6th revision), in the List of Articles added.

In Chemistry the student is recommended carefully to read the first fifty-eight or sixty pages of Attfield, paying particular attention to the two or three pages of definitions; then read the chemistry of the Basic Radicals or Metals, giving due heed to the symbols and formulas, so that he can correctly compute the number of atoms in any given formula, and from their atomic weight can compute the molecular weight of a compound, or the percentage of each constituent. The student may also be required to tell us how much of any given element is present in an ounce or a gramme of any compound. Study also with care the analytical tables on pages 123, 161, 218, 219, 254, 255, not forgetting the notes on the tables, which sometimes go before them and sometimes follow them. (The pages quoted are of the 10th edition; in other editions they may differ more or less.) After the June examination of the present year, the plea that the applicant has never studied Chemistry will not be accepted as a valid excuse for failure to answer, in part at least, the Chemical Questions.

In Pharmacy, Remington or Parrish generally, with special attention to Chapter I. (Remington) on Metrology. We believe that the Metric System and Parts by Weight have come to stay, and shall accordingly formulate some questions bearing on that system of Weights and Measures, and also upon the relations between weight and volume, especially of liquids. Study also Chapter LXV. on Incompatibilities. Some of the questions we shall ask in Ex-temporaneous Pharmacy will belong to one or the other

of the two previous departments. We don't propose to burden the student with memorizing long lists of specific gravities or atomic weights; sufficient data will be given with every question involving such quantities for computation. We would like to know whether the applicant knows anything about the articles he is working with when he is compounding a prescription.

We shall be happy to aid any student entering upon the above course of study and encountering any difficulty with advice or explanation to the best of our ability, if he writes to us, inclosing stamp for return postage, and stating his trouble.

We issue this circular by way of experiment. We are conscious that much which ought to be included is left out; yet it comprises very much more than can be contained in any question paper for examinations as we are compelled to conduct them under present conditions. We hope, however, for some good results from this first attempt, which has been made in the interest of those who have never enjoyed the advantages of a College of Pharmacy.

BY ORDER OF THE COMMISSIONERS OF PHARMACY.

PORTLAND, February, 1889.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,298.—The Estimation of Urea (D. E. and P. A. R.).

As the reply to this query is somewhat lengthy, we have placed it in another part of this number. See page 63.

No. 2,299.—Listerine (B. J. D.).

This is a proprietary antiseptic, which is said to have the following composition (about):

Benzoic Acid.....	130 grains.
Borax.....	120 "
Boric Acid.....	240 "
Thymol.....	40 "
Eucalyptol.....	10 drops.
Oil Peppermint.....	6 "
Oil Thyme.....	2 "
Alcohol.....	8 fl. oz.
Water.....	enough to make 32 "

No. 2,300.—Toddy (P.).

This word, designates an intoxicating beverage prepared originally in India, and at present in many other tropical countries, from the juice obtained by wounding the spathes or stems of certain palms, or from the fruit stalks.

The name *toddy* is a vernacular modification (*tdi*, or *tdti*, written with a cerebral *d*) of the old Sanskrit word *tdla*, which denotes the wine-palm, *Borassus flabelliformis*, and is of very common occurrence, even in old Sanskrit literature. From this is derived *tdti*, which denotes the wine made from the palm, and this word, in passing into the vernaculars, became modified to *tddi*.

The word *toddy* has, of course, no relation whatever to the family name Todd, as might be inferred from the fact that several authorities (such as the French Pharmacopœia) quote a "Potio Todd," which happens to be a spiced kind of brandy, and appears to have originated with some person of the name of Todd, though we have not searched the literature to make sure of this point. Our object here was to put on record the correct etymology of the word *toddy*.

No. 2,301.—Champagne-Cider (H.).

One of our confrères in the country writes that he has a large lot of apple cider barrelled up in his cellar since last fall. He would like to turn it into "champagne-cider," and asks us to send him a formula.

We do so with the reservation that we give the formula on the authority of others, who speak well of it. We have never had occasion to try it. It would be well to experiment on a small scale first, as there will be less risk of spoiling the remainder:

Good pale Cider.....	100 gallons
Alcohol.....	8 "
Sugar (or Honey).....	24 pounds

Mix them. In the case of the sugar, dissolve this in a part of the cider, and add this to the remainder. Let the mixture stand during two weeks in a moderately cool place, but watch it carefully, as it should not ferment before it is bottled. Finally take out a few gallons, mix them intimately with $\frac{1}{2}$ gallon of skimmed milk, and incorporate the mixture thoroughly with the contents of the cask, which will thereby be clarified. Lastly, bottle the clear liquid, and secure the corks. Keep the bottles in a moderately cool place on their sides, or standing up-side down.

No. 2,302.—Hensel's Tonicum (Wheeling).

"Can you furnish me with a working formula for a preparation called 'Hensel's Tonicum,' or, at least, can you untangle its ponderous chemical formula, which is given as:

"Fe," (C₆H₅O₃) Fe" (C₆H₅O₃)? A recent advertisement of the preparation contains vague allusions to formic acid, which I have failed to associate with the above formula."

We know nothing of the preparation in question. Regarding "formic acid," the chemical formula of which is CH₂O₂, there is no possibility of making this agree with any part of the above formula. Taking the first part, the Fe," would indicate that these two atoms of triad iron replace 6 atoms of hydrogen in an acid, the original formula of which must have been C₆H₄O₃. Now we have made some attempt to find such an acid in chemical literature, but have so far failed. There may be a chemical individual corresponding to the above, and we shall be glad if any of our readers can solve the riddle.

The second part of the formula is plainer. The dyad iron indicates that the formula of the acid was originally C₆H₄O₃. This is the formula for saccharic acid, which in most compounds is bibasic: C₆H₄NaO₃, barium saccharate.

Whether the designers of the formula had in view an acid C₆H₄O₄, or whether there is an error in the figures, we cannot say.

No. 2,303.—Impregnating Casks, Wooden Vessels, etc., with Paraffin.

Wooden vessels may be rendered impervious to ordinary liquids by careful impregnation with paraffin. Of course, it is presumed that the joints of staves, heads, etc., are as tight and close-fitting as it is practicable to make them.

Supposing a wooden tub is to be paraffined. It must first be thoroughly dried in a warm place. If possible, several weeks should be consumed by this drying process. Then 1 part of paraffin is melted, under constant stirring, over a moderate fire; when all is melted the heat is withdrawn, and the mass stirred until it begins to stiffen on the surface. It is then carefully mixed with 6 parts of petroleum ether, or bisulphide of carbon, and the solution freely applied to the tub by means of a brush, as long as the wood absorbs any of it. If the tub is to be used only for cold liquids, it is only necessary to allow the volatile menstruum to evaporate, when it will be ready for use.

When the vessel is to be used for hot liquids, the inner and outer surfaces of the tub are finally coated (according to E. Schaal, *Dingl. Pol. Journ.* 271, 237) with a dilute solution of sodium silicate, allowed to dry and then washed off with dilute hydrochloric acid. The silica thus set free closes the external pores and prevents the paraffin from oozing out.

No. 2,304.—Preventing Change in Sublimate Dressings (S. W. M.).

If chloride of ammonium is combined with corrosive sublimate in the proportion of about half a part of the former to each 1 part of the latter, the tendency of the corrosive sublimate to undergo reduction to calomel and metallic mercury upon the fabric is greatly diminished.

Another method, said to be still more effective, is that which was proposed some time ago by Laplace. It consists in adding tartaric acid to the solution:

Bichloride of Mercury.....	5 parts
Tartaric Acid.....	20 "
Distilled Water.....	1,000 "

in which the quantity of bichloride may, of course, be reduced to any desired lower strength. The author directs to soak the fabrics in this solution during 2 hours, then to wring them out and to dry them.

It is, however, a pertinent question whether the efficacy of corrosive sublimate dressings is not dependent upon the fact that the salt *does* undergo decomposition, and by the liberation of nascent chlorine accomplish the effects aimed at. This being the case, it is evident that any method which retards in any considerable degree this change in the bichloride will in just so far render the application of the dressing useless.

No. 2,305.—Jujube Paste (Colorado).

This is prepared by infusing 5 parts of jujubes (see below) with enough water to make 35 parts of clear infusion, then dissolving in this 30 parts of gum-arabic and 20 parts of sugar, evaporating, adding 2 parts of orange-flower water, keeping at a slow and gentle boil for twelve hours, and then pouring into moulds.

The *Zizyphus Jujuba* Lam. or jujube tree is found all through southern and eastern Asia, though in some parts other species of *Zizyphus* predominate. Its wood is tough and strong, and used for many technical purposes. The fruit of the wild kind is dried, powdered, and used in this form in some countries. In others, the tree is carefully cultivated, grafting being commonly resorted to, as this produces a large and milder tasting fruit. The bark is used in the Moluccas in diarrhoea (being a plain astringent), and the root, combined with some aromatics, in fever. Besides the species already mentioned, the *Zizyphus vulgaris*, native of Syria, furnishes the largest supply of the European jujube paste manufacturers.

In India (Bomby), the market is usually supplied from China and the Persian Gulf ports (Dymock). The Chinese dried fruit is there preferred, as it is larger and sweeter. It is 1 to 1½ inches long, and ½ inch broad; skin red, much shrivelled; pulp adherent to the stone, spongy, sweet, and yellow; stone ⅓ of an inch long, very hard and rugose, apex sharp-pointed, shell very thick, seed oblong, flat, of a chestnut color, ⅓ of an inch long, and ⅓ broad. The fruit from the Persian Gulf is somewhat smaller.

No. 2,306.—Florida Water (D. S. W.).

There are various formulas scattered through the literature for making a "Florida Water," but we cannot guarantee that they will produce a product equal to that made by large manufacturers, who have more facilities and better selected ingredients than the maker on a small scale. Florida Water has an immense sale all through the West Indies, Central and South America, the chief supply being from a well-known New York house.

We append a formula for Florida Water, given by Cristiani:

Oil of Bergamot.....	8 oz.
" " Orange.....	4 "
" " Lavender (best).....	8 "
" " Cloves.....	1½ "
" " Cinnamon (Ceylon).....	1 "
Tincture of Orris.....	8 "
" " Bals. Peru.....	4 "
Alcohol, deodorized.....	4 gall.
Water.....	6 pints

Dissolve the oils in the alcohol, then add the water. Allow the mixture to stand for some days before filtering and bottling.

Cristiani gives the quantity of oil of cinnamon as ½ pint. But this must be a misprint, as the odor of this quantity of oil of cinnamon would overcome that of the other oils.

Tincture of orris is directed to be made from 2 lbs. of orris root, and a mixture of 7 pints of alcohol and 1 of water.

Tincture of balsam of Peru is made by dissolving 1 lb. of the balsam in 1 gallon of alcohol.

No. 2,307.—Alcoholic Yeast (M. B.).

This correspondent wants a formula for making yeast. In referring to one which he says he has tried and found a failure, he probably errs when he quotes our journal, as we do not remember having published such a formula in the regular text.

We will, however, take from our files the following, which is well spoken of.

Mix common wheat flour with water to a thick paste, cover it loosely, and keep it for some time in a moderately warm place. After 3 or 4 days it will begin to exhale a disagreeable odor, which will, however, after a few more days give way to a distinctly vinous odor. At the same time gas will be evolved from the mass. In this condition it is fit to excite the vinous fermentation. Now make a wort by pouring upon 10 parts of coarsely ground malted barley 100 parts of almost boiling water. Add 1 oz. of hops for every 2 gallons of the latter. Cover well during one hour. Then strain through a fine sieve or a cloth, and set the filtrate aside until it cools to about 90° F. Now add the decomposed dough—about 1 oz. (or more) for every gallon—previously diluted with tepid water, mix well, and keep the mixture in a warm place.

Fermentation will soon begin, carbonic acid gas being discharged. When the liquid has become clear, this is drawn off, and the yeast will be found as a layer at the bottom.

This may be used at once, in a semifluid condition, or it may be preserved for use by transferring it to bottles or stone jugs, which must be completely filled, and well stoppered. A layer of olive oil poured on top will keep out the air. The bottles must be kept in a cold and dark place.

No. 2,308.—Huebl's "Iodine-Number" (Ga.).

In the course of correspondence with several of our subscribers who are interested in certain fixed oils, it has been ascertained that the knowledge of Huebl's (Hübl's) method of distinguishing oils, by comparing their respective capacity of absorbing and combining with iodine, is comparatively little known or used here. A somewhat detailed description of it will, therefore, be welcome.

Nearly all fats and fixed oils contain members of different groups of fatty acids. One of these groups is that which begins with formic acid (CH_3O_2), and includes, among others, butyric, capric, myristic, palmitic, margaric, stearic, etc., acids. This group represents the so-called saturated fatty acids. Its members have no affinity, under ordinary circumstances, towards halogens, such as iodine.

The fatty acids belonging to the other series, however, that beginning with acrylic ($\text{C}_2\text{H}_3\text{O}_2$)—including hypogaeic, oleic, and other acids—and that beginning with tetrolic acid, have a decided affinity for halogens, as they are not saturated. By estimating the amount of iodine which each one can combine with, a clue to the identity of the different fatty acids and fats may be obtained.

Of course, if it is not known beforehand that the fat under examination is derived from a single natural source, the determination of the iodine number is of but little value, since two or more fats, of high and low iodine numbers, may have been mixed together, and the compound may show the iodine number of some simple natural fat of intermediary position. But if the iodine number is either the highest or the lowest that has ever been observed upon pure fats, then the operator has probably samples of pure fats (from either end of the series) under his hands.

Iodine, when brought in contact with fats in the cold, acts upon them very slowly. The application of heat would, in many cases, bring about unreliable results, since even "saturated fatty acids" are apt to form iodine substitution products under these circumstances. Hübl has, however, found that, in presence of mercuric chloride, an alcoholic iodine solution quickly acts upon the fats or oils, there being not only iodine but also chlorine added to the molecule of the fat. It has been shown that for every two atoms of iodine used there must be present one molecule of mercuric chloride. And since most fats or oils are insoluble in alcohol, some chloroform is added as solvent, which does not interfere with the reaction in the least.

The alcoholic, iodized solution of mercuric chloride does not keep long. It must, therefore, be assayed previous to any new series of experiments. The following reagents are required for Hübl's process:

1. Iodized solution of mercuric chloride. Dissolve 25 Gm. of iodine and 30 Gm. of mercuric chloride, each separately, in 500 C.c. of 95% pure alcohol, filter the latter solution, if necessary, and then mix them. Let the mixture stand about twelve hours, during which time it will somewhat change in composition. Then ascertain its strength of iodine by means of the hyposulphite solution.

2. Hyposulphite solution. About 24 Gm. in 1 liter. The strength or titer is determined with pure, sublimed iodine.

3. Pure chloroform. This must be tested by mixing 10 C.c. of it with 10 C.c. of the iodized solution. After standing three hours, it should require exactly the same volume of the hyposulphite solution to discharge the color in the mixture as is required for 10 C.c. of the original iodized solution.

4. Solution of iodide of potassium, 1 in 10.

5. Solution of starch, fresh, 1 per cent.

The sample of fat or oil to be examined is best weighed in a small, light beaker. If solid, it is melted, then poured into a flask of the capacity of 200 C.c., provided with a glass-stopper, and the beaker weighed again. The difference represents the amount put in the flask. The quantity to be taken depends upon the known or expected iodine-figure. Of drying oils, 0.2 to 0.3 Gm. are taken, of non-drying 0.3 to 0.4 Gm., and of solid fats 0.8 to 1.0 Gm. Next, 10 C.c. chloroform are added to the fat in the flask, and when the fat is dissolved, 20 C.c. of the iodine solution are added. If the liquid is not quite clear upon being agitated, a little more chloroform must be added. If the iodine color disappears in a short time, this shows that an insufficient amount of iodine has been added. In this case, 5 or 10 C.c. more are run in. The iodine must be so far in excess that the liquid will possess a deep-brown color even after 2 hours' standing. A decided excess of iodine must always remain over, otherwise the subsequent assay will yield low results.

At the end of two hours, the free iodine is determined by titration. First, about 15 C.c. of the solution of iodide of potassium are added, and then about 150 C.c. of water. A portion of the iodine is contained in the aqueous liquid, and another portion (separated during the dilution) is contained in the chloroform. From a burette divided into ½ C.c. hyposulphite solution is carefully added, the flask being often agitated, until both aqueous and chloroformic layers have lost most of their tint. A little starch is now added, and the titration with hyposulphite cautiously continued—the flask being frequently agitated, while stoppered—until the blue tint of iodide of starch has just disappeared.

Immediately before or after the preceding operation, a measured quantity (say 20 C.c.) of the iodized solution of mercuric chloride is titrated with the same hyposulphite solution, and upon the basis of this assay the strength of the hyposulphite solution is ascertained.

The number of parts of iodine required by 100 parts of any fat or oil is called the "iodine number."

Thus, for instance, the "iodine numbers" of some well-known fats, etc., are as follows:

Oil of Sesame.....	105-108	Castor Oil...	84-84.7
" " Cottonseed.....	105-108	Butter.....	26-33.4
" " Olive.....	81.6-84.5	Linseed Oil.....	170-181
Lard.....	57.6-60		
Oil of Almond.....	97.5-99		

Vehicle for Iodide of Potassium.—Dr. Blair some time ago (in the *Boston Med. and Surg. Journ.*) recommended milk as an excellent vehicle for administering iodide of potassium, as it covers the taste of this salt perfectly.

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[ORIGINAL COMMUNICATION.]

THE ART OF DISPENSING.

[Continued from page 49.]

PILLS AND THEIR PREPARATION.

THE characteristics of well-made pills are: that they are not too soft; do not stick together nor flatten; that they are smooth and round; all of the same size, and that they all contain similar proportions of the ingredients.

As far as possible it is advisable that pills should be of the same weight as prescribed, although this is not always possible owing to the soft condition of some extracts requiring an addition of a powder to make them firm enough to be rolled. A soft extract may be evaporated to increase its consistence, but it is inconvenient to do this at the dispensing counter while the prescription is being compounded; therefore it is well to be prepared beforehand, and to have the more commonly used extracts both in a soft condition and in a state sufficiently hard to be rolled into pills with but little or no addition of powder. Some extracts are best kept in powdered state (the compound extract of colocynth being a notable instance), but it is not possible to do this with all, for many, after being powdered, will gather moisture from the air and run together into a mass.

Where pills of one kind are frequently prescribed, it will be found convenient to keep the mass in form of powder and ready to be mixed when wanted, *e. g.*, compound cathartic pill, pill of aloes and myrrh, compound rhubarb pills, etc. When a pill mass cannot be kept in a powdered condition, but must be in the form of a mass, it is well to wrap it in paraffin paper and place it in a covered jar until wanted.

A mass to be in good condition to form a pill must be sufficiently firm, plastic and adhesive, and the ingredients of which it is composed should be intimately mixed, no individual particles being discernible. The parts should be held together by some substance with sufficient cohesion to endure the process of rolling and cutting without crumbling or cracking. The pills, when formed, should remain perfectly globular, and should still be soluble in the fluids of the stomach and intestines soon after being taken. Failure to obtain these conditions may be ascribed to a variety of causes, as, for example, excess or deficiency of a moist extract, presence of hygroscopic or deliquescent bodies, chemical incompatibility of ingredients, excess of essential or fixed oils, injudicious choice and use of excipients, or bad manipulation.

The plasticity of a mass is obtained by thorough working or kneading. To do this, the pestle and mortar must be freely used, or the kneading may, in some instances, be done with the hands. Adhesiveness may be obtained from the extracts, if any are ordered, or by means of excipients. It may suffice to heat a mass to render it soft and capable of being rolled, in which case it will become firm again as it cools. Much care, however, must be exercised in using heat, since it is liable to impair or utterly destroy the medicinal value of some drugs. It will usually be found that by placing the mortar and pestle in hot water for a few minutes, they will become warm enough to facilitate the process of kneading.

A small water-bath (always a valuable article of furniture on a dispensing counter) or a small hot-water plate should be at hand for evaporating extracts or softening a mass. The manipulation of large quantities of pill-mass, and many of the operations connected with pill-making, are greatly facilitated by the use of a smooth slab of iron about nine inches square (one-quarter-inch boiler plate will answer); this is quickly warmed over a gas stove, and when contact with the finger indicates a proper temperature, it can be removed and the mass placed upon it. Pills containing much gum resin should be made with its assistance. Black pitch, solid Chian turpentine, and other substances hard and brittle in the cold may be rolled upon the warm iron slab and made into pills without addition of a liquid excipient, but some require fibrous material, such as licorice powder or lycopodium, in order to prevent their falling. Substances that are efflorescent should be deprived of their water of crystallization before being made into pills; those that are decomposed by iron, such

as corrosive sublimate, calomel, nitrate of silver, copper and bismuth salts, must not be mixed in an iron mortar. Crystallized salts, fluid acids, or soft extracts with an organic powder often make a mass of muddy consistence, which rights itself by waiting ten to fifteen minutes. Time should always be given an organic powder to absorb moisture.

When a prescription calls for several powders, always see that they are well mixed together before adding any extract or excipient. If, in addition to two or more powders, there is more than one extract, the powders and the extracts should be mixed separately, then added to each other. By this means you can be sure your pill-mass is well mixed.

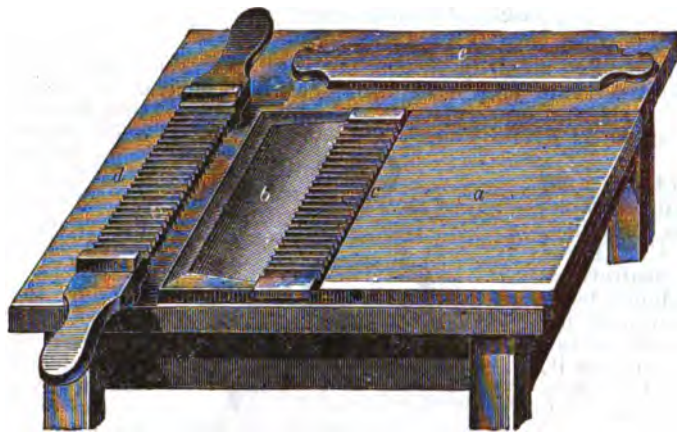
EXCIPIENTS.

The excipient is the substance, either liquid or solid, which is added to the ingredients of a prescription to bind them together, and thus give them such a consistence that they may be massed and rolled into shape. To be able to select the best excipient for the prescription on which he is at work, the dispenser acquires a knowledge of the physical properties of the drugs which it contains. Where no excipient is ordered, the simplest should be selected, and that which gives the least increase to the size of the pill. Generally speaking, the dispenser has one excipient that he prefers and uses in the majority of cases; it may not be the best in every case, but, because he is in the habit of using it, and knows well its massing powers, he

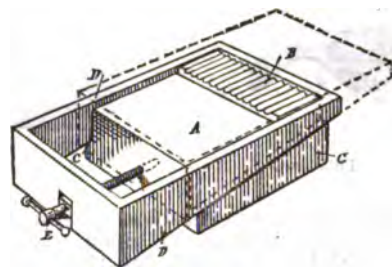
can produce better results with it than with any other, and if he should try to make a mass with any other excipient, the chances are that the attempt would end, at least in the first instance, in failure. A dispenser should, however, familiarize himself with the use of many different kinds of excipients, so as not to get into the rut of using only one or two; for a prescription should be prepared the same way each time, though different pharmacists work it at different times. It is necessary for the dispenser to be ready for any emergency on a prescription, and unless he has gained this element of familiarity with all things connected with

his work, he is liable at any time to be put to a disadvantage.

Many things have been recommended as excipients: Water, alcohol, mucilage, or powdered acacia, glycerin, honey, glucose, simple syrup, confection of roses, powdered althæa, bread crumbs, glycerite of starch, glycerite of tragacanth, and in some cases resin cerate, wax, Cacao butter, and petrolatum. Of these, the best for general use is the glycerite of starch.



Pill-machine.—a, the bed on which the mass is rolled with the aid of the rolling-board c; b, receptacle for the pills after they have been divided by the metallic cutters c and d.



A contrivance enabling the operator to regulate the thickness of the "pipe."

Water, Alcohol.—Many substances do not require the addition of any other excipient than water, or, in cases where resinous substances are prescribed, alcohol alone may be the only thing needed, as often water or alcohol will develop enough adhesiveness to form the mass; the great objection to the use of either of those liquids without the aid of other excipients is, the pills made with them become very hard; they possess one advantage, which is not always remembered, of sometimes diminishing the bulk of the pill by partially dissolving the ingredients; often pills, that otherwise would be of inconvenient size, can be made more satisfactory, in this respect, to the patient. Water, alcohol, or any other excipient should not be used alone when they are capable of perfectly dissolving the solid substance of the pill; for though the pills may be firm enough when dispensed, after standing, especially

in warm weather, they are apt to run together in the box. In such instances an adhesive powder should be used to overcome the difficulty.

Mucilage, Powdered Gum Arabic, or Tragacanth are very adhesive excipients, and may be used; but they are often objectionable by causing the mass to become too hard and insoluble. With some substances (such as calomel), acacia forms a perfect cement. Tragacanth, when added in too great quantity, causes the mass to become so elastic that it is almost impossible to roll it out.

Syrup, Honey, Glucose, are all adhesive and valuable excipients, but should be used in connection with glycerin to prevent the excessive hardening of the pill. In the selection of these, syrup or glucose should be used for light-colored masses, as honey is apt to make the mass dark.

Glycerin is valuable, as it prevents the pills from becoming hard; it is somewhat adhesive, and for quinine pills that are not to be coated is one of the best excipients that can be used. It is best to mix it with one-third of its weight of water or alcohol.

Confection of Roses, an old-time excipient, is not used much now, as it adds too much to the bulk of the pill, and is no better than many other excipients; it is useful sometimes when small quantities of active ingredients are to be made into pills, such as strychnine or podophyllum. It should never be used with iron compounds, as it is incompatible with them.

Soap is an excellent excipient for some masses, especially if they contain resinous substances, as it increases their solubility. This excipient is ordered in the U. S. Pharmacopoeia for *Pilulae aloes*, *Pil. asafetidae*, *Pil. opium*, and *Pil. rhei*. It should be in a very fine powder; it is not suitable for masses containing acid salts, acids, metallic salts, or tannin, as these decompose it. In using this excipient, care must be taken not to use too much water. The mass will at first appear dry and crumbly, and the dispenser is tempted to add more water, but soon finds that he has too soft a mass. Alcohol has this effect on soap masses to a still greater extent, so that it has to be used more carefully.

Bread Crumb, mica panis, is an excipient that has been recommended for many years for volatile oils, creasote, etc., but it is rare to find any one who uses it at the present day. It has been tried in every form recommended, and many experiments repeated, and in every case an equal if not a better excipient could have been em-

melting point of the mass is raised above the heat of the body, for the pill will pass the body unchanged. The wax must be melted very slowly, and with a very gentle heat, with some of the substance with which it is mixed. When the mixture is quite cold, the other ingredients are to be combined. The addition of ether or spirit destroys the plasticity of this compound.

Cacao Butter and Petrolatum (vaseline) are both used for oxidizable substances, such as permanganate of potassium.

Glycerite of Starch (U. S. P.) is probably the best general excipient for pills that can be employed. It is white, and of an unctious consistence, and, therefore, convenient to use. It will form almost any substance, no matter how dry or contrary, into a firm, tenacious mass; the glycerin in it prevents the pill from becoming hard, and it does not have the tendency to draw moisture so readily as when glycerin alone is used in the mass; it adds but little to the bulk of the pill, its excellence is appreciated at once, and experience with its power of massing pills will prevent any one from resorting to other excipients.

Glycerite of Tragacanth, next to glycerite of starch, is a favorite with some dispensers, but for certain substances it is too thick and tough; it is used principally for pills containing salts and metallic oxides, such as bromide of potassium and subnitrate of bismuth. In

using both this and the glycerite of starch, the mass must be well kneaded, or more of the excipient will be used than is really necessary.

The quantity of an excipient necessary to mass the pill should be known beforehand. This knowledge, of course, can only be gained by experience; but when known, it will save considerable trouble, for the addition of the excipient adds much to the labor, and not infrequently to the size of the pill. If it seems necessary to make pills up to a certain weight—more than the ingredients of the prescription call for—add the right proportion of some inert powder, and always make a note of its quantity, also the quantity of the excipient used, upon the prescription, so that when it is renewed the pills will always be of the same size. Great care should be taken that pills dispensed at one time should not differ in size from the same dispensed at another. Generally it will be found that pills are seldom

prescribed more than two grains each in weight. It is a good plan before rolling into pills to weigh the mass to see that it corresponds with the total weight of the ingredients. Be careful to scrape all the mass out of the mortar, for frequently it will be found that a large proportion is left there unless this is done.

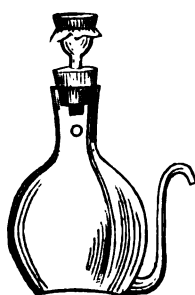


FIG. 1.

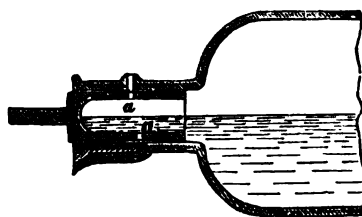
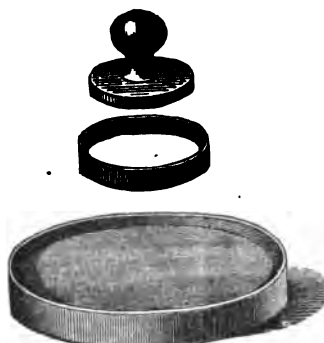
FIG. 2.
Varieties of dropping bottles.

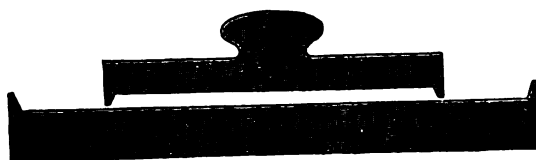
FIG. 3.



Vial's pill-rounder.



Pill-sieve.



Pill-rounder.



Pill-sieve.

ployed. Either the mass crumbles, or is in an unmanageable paste, or oozes with uncombined oily matter. Pills can be made with bread crumb, but they require such attention, and so frequently disappoint the dispenser, that this excipient is not worthy to retain a place in practical pharmacy. When mica panis is ordered as an excipient, which is not a common thing, wheat flour and water q. s. may be used, if these will make a mass with the medicinal ingredients.

Athaea gives adhesiveness and is useful as an absorbent, but is open to the objections of increasing the bulk of the pills too much, is apt to make the mass too elastic to work well into shape, and causes hardness.

Wax has been recommended as an excipient for balsams, oils, etc.; but it is objectionable, owing to its insolubility in water, and consequently in the fluids of the stomach. An ordinary pill, though much harder than a wax pill, may dissolve in the stomach, because its ingredients are soluble in water. This excipient should not be employed if it be necessary to use such a quantity of it that the

When using a liquid or any excipient, be careful not to use too much, or the mass will be made too soft and will require an addition of some powder to render it firm, and thus too much bulk will be given your pills. When fluids require to be added to form a pill-mass, it will be found risky to add them directly to the mass from their containers, for generally too much will be dropped on; a good plan is to drop the fluid first upon the point of a spatula, and from it to the mortar in quantity necessary to form a mass. Salts easily soluble in water naturally require very careful addition of moisture. To drop an excipient, it is well to use a pipette (a small glass tube with one end drawn out fine and a rubber nipple on the other); they are made so as to drop 60 drops to the fluidrachm, and can be purchased for about 25 or 30 cents per dozen; or a dropping-bottle called Salleron's drop counter (see Fig. 2) can be used, or an ordinary bottle with a wide mouth can be taken and fitted with a rubber stopper having two holes with a glass tube in each, one of the tubes having an imperforated nipple on it, the other tube being drawn

out to a small point. By compressing the nipple, air is blown into the bottle and forces the liquid out of the other tube. This is an invention of Mr. Raoul Bravais. Wharton's dropper serves a good purpose for regulating the flow of liquid excipients for pills. Any pharmacist can make one by simply taking an empty morphine bottle and boring a hole into the shoulder by means of a rat-tail file kept moist by turpentine; insert a bent tube, glass or otherwise, make it air-tight, close the mouth of the bottle with a small finger stall drawn tightly over it. By slight pressure any liquid contained in the bottle flows through the tube drop by drop, or it may be caused to flow in a stream if desired. An ordinary empty 1-oz. wide-mouth bottle may be fitted with a sheet of india-rubber a little larger than the mouth of the bottle, and a hole in the centre; a glass rod running to the end of which is enlarged and drawn out fine; by dipping the rod in the liquid, enough will collect on and may be dropped off.

Have several bottles on the prescription counter containing the various liquid excipients, fitted up in any of these ways so as to be handy when wanted, especially one with glycerin and water and one with glycerin and alcohol. Never use the same spatula to scrape the mass from the mortar or pestle and to dip in the excipient or extract jar. Have plenty of spatulas, so as to use a clean one for each ingredient that cannot be easily wiped off. When the quantity of extract ordered would make the mass too soft, the dispenser must either use it in a drier state or add some inert powder to it. Hager suggests that some powder of the same plant may be substituted for a portion of the extract, as for instance, if 20 grains of extract gentian are ordered, 10 grains of the extract might be used with 10 grains of powdered gentian; but this is objectionable from the variation which is apt to occur in the size of the pill, 10 grains of extract and 10 grains of the crude powder frequently producing an objectionable increase in the bulk of the pill. The better plan in such cases is to diminish rather than increase the size, and the extract had better be evaporated to a proper consistence, and for this reason every pharmacist should have some simple and ready appliance for accomplishing this without risk to the extract.

Rolling.—In most establishments there is available but one size of pill machine. On that must be rolled all masses whether it is to be divided into 1 grain or 5 grain pills, and it is often a matter of difficulty to roll out a small pill upon the large machine. To meet this disadvantage, a pill roller may be used, made of hard wood, such as maple, pear, or box. It should be about three inches broad, or any length less than the breadth of the machine, the handle securely fixed into the bottom piece with glue; or the roller may be fitted, like a horse-brush, with a leather strap nailed to each side, going across the top, under which the four fingers of the hand are placed, while the thumb fits on one side to steady it. If made of wood $\frac{1}{2}$ inch thick, 6 inches long, and 4 inches broad, it will be found very convenient to use not alone for rolling into pipe, but also to help work the mass up. Another idea is to insert into the bed of the machine a piece of mahogany or walnut board (about $\frac{1}{2}$ inch thick), made the required size, so that it may slip into the machine and be a tight fit. By this arrangement the ordinary roller can be used, and $\frac{1}{2}$ grain or 1 grain pills are rolled out quite easily. Failing these, the pill roller itself can be used by turning it lengthwise to the machine. Care must be exercised to see that the pipe is equally rolled out, and not let any portion of the mass be larger or smaller than the other, or your pills will not be uniform in size. It will be found necessary to take the pipe between the fingers, and straighten out any inequalities.

Rounding.—Pills are generally rounded with a pill-rounder. Rounding pills with the fingers is only permissible when the mass is of such a character that it crumbles under the rounder. The ordinary rounder has a deep and a shallow side, so that large and small sizes may be rounded in it; but if either is too deep, the insertion of a piece of cardboard is useful. A French pill rounder is made (Vial's *Disque a pilules*) which can be put together to suit any ordinary size; or if there be no regular pill rounder handy, the cover of a small, round wooden box can be extemporized. The cut pills are laid on a tray, or on the pill machine, sprinkled with powder, and, being covered by the rounder, they are rapidly, and with slight pressure, revolved.

Powder is used to prevent pills from sticking to each other or the box, and to some extent to conceal their taste. When no particular powder is ordered, lycopodium is what is commonly used. Starch powder, cinnamon, magnesia, licorice, and powdered French chalk are all used. Licorice or cinnamon is apt to give a taste to the pill which is often objectionable to the patient; powdered French chalk is apt to make the slab slippery. This may be overcome by the addition of a little starch powder. Do not make the mistake of leaving too much powder in the box when you pass the prescription out; either blow out or use a pill sieve to remove the surplus powder. Pills with hygroscopic, strong-smelling, or volatile ingredients should always be dispensed in bottles.

[To be continued.]

[ORIGINAL COMMUNICATION.]

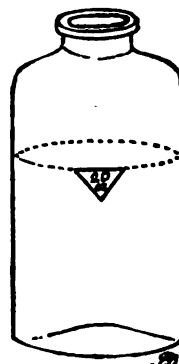
A PRACTICAL MODE OF GRADUATING RECEIVERS.

IN percolation and other processes where a certain volume of a liquid is to be obtained, and where a graduated bottle is not at hand, it is usually the custom to paste a strip of paper on the bottle at the point to which the liquid is to come.

In order that the operator may not forget whether the liquid is to come on a line with the upper or lower edge of the paper strip, it has been my custom to use a triangular piece of paper, so there is but one edge parallel with the surface of the liquid.

E. H. W. STAHLHUTH.

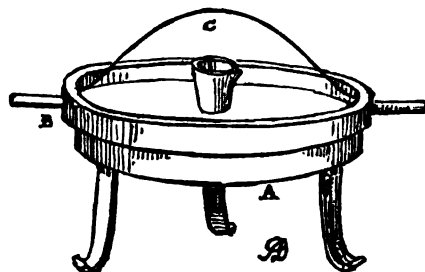
COLUMBUS, IND., March 1st, 1889.



SUBLIMING APPARATUS.

J. W. BRUEHL has had occasion to carry out a large number of sublimations, chiefly for the purpose of purifying certain substances, and has found the apparatus here described to be specially serviceable.

It consists of a nickel-plated circular brass box B, resting upon an ordinary tripod A. The brass box has two lateral tubes, for the passage of a current of cold water. In the centre, the box has an orifice large enough to permit the insertion of a crucible, which hangs down suffi-



ciently low to permit its bottom being heated by a very small flame, without also heating the brass box. The latter acts, of course, as a condenser. The whole is covered with a glass bell. The crucible should touch the box only at a line in its circumference, and not at any extended portion of its surface, and it is preferably chosen of some well conducting metal, such as copper, platinum, etc. The glass bell should not be high, but rather flat, as in this case the sublimed crystals will scarcely at all collect on the glass, but on the cold surface of the box, from which they may easily be removed.—*Berichte*, 1889, 238.

Solution of Albuminate of Iron.

EUGENE DIETERICH, of Helfenberg, has published a new process for making this preparation. He points out that the various commercial articles known as "Soluble Albuminate of Iron" differ very much among themselves, some of them being practically insoluble, so as to be useless for preparing the "Liquor Ferri Albuminati." Dieterich himself had previously offered or used formulas which, though the best he could give, were not always satisfactory. He has, however, since then succeeded in making an albuminate of iron (ferric) which, when in fine powder, is easily soluble to a clear liquid in very dilute solution of soda. In its dry condition it appears as an ochre-yellow powder, without odor or taste, and neutral to test-paper. On triturating 1 Gm. with 40 Gm. of water in a mortar, and subsequently adding 0.4 Gm. of solution of soda [15%], the compound will dissolve to a garnet-red liquid. It contains about 20 per cent of iron (Fe). For the present no process is published by Dieterich, this being probably reserved for a subsequent publication.

The solution of albuminate of iron is to be prepared as follows:

	Parts.
Soluble Albuminate of Iron (Dieterich's dry).....	20
Solution of Soda (sp. gr. 1.160).....	8
Alcohol.....	100
Brandy.....	100
Tincture of Ginger.....	1.5
" Galanga.....	1.5
" Cinnamon.....	1.5
Water.....	enough to make 780

Triturate the albuminate in a mortar, with water, transfer to a flask and add the remainder of the water. Now add the solution of soda, shake repeatedly until solution is effected, and then add the alcohol, brandy, and tinctures.

In place of the tinctures the Pharmacopœia Committee of the German Pharmaceutical Association recommends to use 250 parts of cinnamon water, which are to replace an equal volume of common water.

The product is a clear, garnet-red liquid containing 0.4 per cent of iron (Fe).—After *Pharm. Centralt.*, No. 18.

Oils of Cassia and Anise.

SOME important particulars with regard to what (according to the writers) appears to be becoming the general practice of adulterating essential oil of cassia are given in Messrs. Schimmel & Co.'s April report. After referring to the manner in which the price of that oil on the Hong Kong market has advanced from \$103 per picul, or about 3s. 2½d. per lb., in September, 1888, to \$120 per picul, or, say, 3s. 9d. per lb., in February, 1889, and still appears to show signs of a further rise, the report makes mention of a rather alarming discovery which has been made at Messrs. Schimmel's works during the rectifying of some cassia oil. The rectification, in short, would seem to have revealed the fact that the greater part of the cassia oil of commerce is of a greatly adulterated nature, and nothing short of united and energetic action of the European buyers at the Chinese ports will suffice, it is said, to put a stop to this evil practice.

Cassia oil is brought into commerce by the European agents in Macao, Canton, and Hong Kong, who buy it from the native producers through the medium of Chinese middlemen. The labels affixed to the packages all bear the name of Macao, but Messrs. Schimmel & Co. state—what, indeed, is well known—that the oil is not actually distilled there. They suspect that the sophisticated of the drug are the distillers themselves, who bring it to the trade centres already adulterated. A shipment which was accompanied by a guarantee from the Hong Kong Medical Hall declaring it to be genuine unadulterated oil of cassia, of 1.060 specific gravity, dissolving readily in alcohol at 80° F., and perfectly volatile, when tested by purchasers in Europe was found to contain no less than 20 per cent of an insoluble resin, as well as a not inconsiderable percentage of petroleum, the latter having probably been added in order to again bring up the specific gravity and the consistency of the mixture to the nominal point of pure cassia oil. The examination of samples taken from four of the principal brands of cassia oil now in commerce, viz.:

Yellow label with American eagle and name Yan Loong, Macao;

Yellow label with sailing vessel and name Cheong Loong, Macao;

Pink label with flower design and name Luen Tai, Macao;

Red label with words "Best Cassia Oil" and name Ying Chong, Macao;

showed that the first three named were grossly adulterated. The appearance, so it is stated, of these oils at once excites suspicion by the dark brown color and the unusual consistence of the samples—the oil when shaken being apt to cling to the sides of the bottle. The specific gravity of the samples under examination did not differ much from that mentioned in the certificate of purity, ranging from 1.052 to 1.065. The boiling points lay between 200° and 295°. After distillation between 23 and 26 per cent of the sample remained behind in the shape of a brittle resin. In order to remove all doubt as to the character of the samples, and with a view of forestalling the anticipated explanation that resin was caused by heating over an open fire, several canisters of the three brands indicated were distilled over water. The bulk of the distillate so obtained sank to the bottom of the water, and the latter was found upon examination to be petroleum. The distillation over water also yielded between 19 and 26 per cent of a residual resin, of a brittle character. The fourth parcel of cassia oil—that of the Ying Chong chop—only gave a loss of 7 per cent in the distillation over water, while the whole of the residue remained liquid. This chop, therefore, the investigators recommend to the attention of the Hong Kong and Macao agents.

For the proper examination of the oil it is absolutely necessary to distil it over an open fire or by means of vapor. The residue should not harden when cooling, and the parts which volatilize first should have no flavor of petroleum. If the distillation is continued, about 90 per cent of pure cassia oil should be distilled by the water vapor, and the rectified oil should have a specific gravity of between 1.055 and 1.065. With regard to Messrs. Schimmel & Co.'s somewhat alarming assertions, we may say that in England buyers attach very little weight to the labels on the packages, as it is the universal custom among the large consumers to buy the oil according to sample, and it does not seem that this mode of doing business has thus far given rise to any unusual number of claims. Some of the continental customers of our exporters do indeed give the preference to one particular brand or the other; but as a great deal of the continental business in cassia oil is now transacted directly, the fancies of continental consumers do not any longer affect the trade in this country. It appears that the cassia oil, though shipped to Europe from Hong Kong, is all brought there from Macao, further southward. Macao is in fact the market where the oil originally changes possession from the hands of the natives into those of European dealers; but as it is a decaying old town, and not, we believe, in direct communication with Europe, the oil has to be sent on to Hong Kong for further shipment. With the further opening up of the borderland between China and Tonkin, it is probable that cassia oil, as well as most other pro-

ducts of Southern China which now find their way via Macao, will be diverted to other routes.

A second statement in Messrs. Schimmel's report to which we desire to draw special attention is that referring to the relative output of oil of star anise and of European anise. In the report, Mr. John C. Umney and Mr. John Moss are found fault with because the former, in a paper on the congealing point of oil of anise, read at an evening meeting of the Pharmaceutical Society last February, stated that by far the greater portion of the anise oil now used in commerce was that of star anise. "A very high authority," the author of the paper continued, "gives it that for every lb. of 'aniseed' oil (*Pimpinella Anisum*) one would meet with 1,000 lbs. or even more of star-anise oil (*Illicium anisatum*)." And in the debate following the paper, Mr. Moss asserted that he believed the proportion of one to a thousand to be much below the mark, and the real figures to be nearer one in ten thousand. "It is evident from these statements," now say Messrs. Schimmel, "that our English colleagues very much underestimate the importance of the manufacture of anise oil; and as we cannot allow their erroneous statements to obtain further currency, we wish to point out as follows: In our factory alone, under normal conditions, 7,000 kilos. (= 140 cwt.) of aniseed are worked every day, equalling a daily production of 200 kilos. of oil. Between October, 1887, and May, 1888, about 800,000 kilos. (= 800 tons) of aniseed were consumed on our works, producing about 24,000 kilos., or 53,500 lbs., of oil, and we are well within the mark if we calculate the production of aniseed oil from *Pimpinella Anisum* as follows:

	Kilos. =	about lbs.
Germany	30,000 =	67,000
Russia	10,000 =	22,500
Austria.....	2,000 =	4,500
	42,000 =	94,000.

which by weight equals 1,400 cases of star-anise oil. It may be questioned whether the entire yearly production of star-anise oil equals 1,400 cases, let alone 1,000 or 10,000 times that number." And in another paragraph they add: "As regards oil of star anise, that article has been very much pushed in the background in several of the principal consuming centres, in consequence of the low prices of oil of anise. Even in markets such as North America, where, some years ago, star-anise oil was used almost exclusively, the employment of oil of anise advances every year." Now, we believe Messrs. Schimmel & Co. are rather under a misapprehension if they believe that the speakers at the evening meeting referred, or meant to refer, to the world's consumption of oil of anise. They did nothing of the kind. Both Mr. Umney and Mr. Moss (though the latter might, perhaps, have been content without improving upon the previous speaker's statement) referred throughout their remarks to the consumption of anise oil in England only, and both were perfectly well aware that in Germany, and other countries where the oil from *A. pimpinella* is official, their remarks would not hold good. As regards the production of star-anise oil, although no precise figures are available, we would not put it as high as 1,400 cases per year by a long way.—*Chem. and Drugg.*

New Process for Hardening Plaster of Paris.

THE French Academy of Sciences, says *La Semaine des Constructeurs*, has just received a communication from M. Julte on a new process of hardening plaster so as to adapt it to the construction of flooring in place of wood, and to other purposes [such as plaster splints, for instance, for which reason we publish this paper.—Ed. A. M. D.] for which it cannot be used in its ordinary state on account of its want of hardness and resistance to crushing.

M. Julte recommends the intimate mixture of six parts of plaster of good quality with one part of finely sifted, recently slaked white lime. This mixture is employed like ordinary plaster. After it has become thoroughly dry, the object manufactured from it is saturated with a solution of any sulphate whatever whose base is precipitated in an insoluble form by lime. The sulphates best adapted for the purpose, from every point of view, are those of iron and zinc.

With sulphate of zinc, the object, at first greenish, finally assumes through desiccation the characteristic tint of the sesquioxide of iron. The hardest surfaces are obtained with iron, and the resistance to breakage is twenty times greater than that of ordinary plaster. In order to obtain a maximum of hardness and tenacity, it is necessary to temper the limed plaster well in as brief a space of time as possible, and with no more water than is strictly necessary.

The plaster cast, or other object to be hardened, should be very dry, so that the solution employed may penetrate it readily. The solution should be near the point of saturation, and the first immersion should not exceed two hours. If immersed too long, the plaster would become friable.

The proportions of the lime and plaster are arbitrary, and may be varied according to the results to be obtained; nevertheless the proportions of one to six have given the best results.—After *Scien. Amer.*

Hydrometers for Weight of Alcohol.

THE German Federal Council has authorized the use of hydrometers for *weight* of alcohol, besides those hitherto in use, which were graduated for volume. The new instruments are verified by the Government Bureau of Standards (Normal-Aichungs-Commission).

Tables which show the corresponding values of the weight-alcoholometer and that for volume are about to be issued. [It will be easy for any one residing in this country to obtain not only the official instruments, but also the tables, by giving an order for the same to some importer of chemical apparatus.—ED. AM. DRUGG.]

In order to distinguish the new instruments, they will be marked with two red stripes upon the scale of the thermometer. Each set will consist of three spindles, one giving alcoholic percentage from 0 to 10 (exclusive) in whole numbers; the next, from 10 to 65 (exclusive), in whole numbers and half per cents; and another from 65 upwards, in whole and $\frac{1}{2}$ per cents. The first spindle has a centigrade thermometer graduated from 0 to 25° C.; the second and the third ones from -12 to +30° C.

The new alcoholometers are made and sold by the glass works of the United Spirit Manufacturers (Glasbläserei des Vereins für Spiritusfabrikanten), of Berlin, at 12 marks for No. 1 and 2, and 20 marks for No. 3. Case, floating cylinder, etc., are extra.—After *Dingler's Pol. Jour.*, 271, 421.

Commercial Note on Cascara Sagrada.

MESSRS. SCHÖELLKOPF, HARTFORD & MACLAGAN, limited, of New York, send the following communication on cascara sagrada to the *Chemist and Druggist*:

The source of supply of the true thin genuine cascara was originally the northern portion of the State of California, but as the demand soon outgrew the supplies in this district, other sections were drawn upon, and of late years the bulk of the bark sold as thin Californian cascara has really been drawn from Coos County, Oregon, the shipping port being Marshfield. Considerable quantities also came from points further north in Oregon, the port being Portland. As nearly all the supplies from these districts reached the consuming markets *via* San Francisco, they were described as Californian bark. What is now known as Oregon cascara (the thick bark in long quills) really comes from Washington Territory, being collected as far north as Puget Sound, the principal shipping depot being Seattle. The terms Californian and Oregon used in describing these barks being misleading, it will be found preferable to change them to southern thin and northern thick bark. The thick bark, manufacturers here admit, is equally as good therapeutically as the thin, but the latter, being hitherto plentiful and cheap, naturally got the preference. When broken into small pieces the thick bark presents a handsome appearance, and will, we think, in the future sell equally as well as the thin. Some stress is laid on the color of the inside of cascara, but we do not attach any great importance to this, for all depends on the drying; buyers prefer the light buff color, but a walnut shade is, in our opinion, no detriment to the bark if sound. What was first known as spurious cascara is now recognized as genuine cascara, but collected in the winter out of season. It will be convenient to call these grades "winter" cascara. That described by Mr. Moss as No. 2 cascara "out of season" is thin southern bark cut off the branches with spokeshaves. This has received considerable attention of late, fully 5,000 lbs. finding its way into consumption in the States, advancing from 1s. 6d. to 2s. c. i. f. There is only a small quantity available now, and it is doubtful if more can be had as the collection was discouraged, dealers saying it was unsalable. The kind described by Mr. Moss as No. 4 cascara "spurious" came from Washington Territory, and is, therefore, of the thick variety. From what we can learn, some of this was obtained by steaming the branches, to soften the bark, and then cutting it off with knives. It does not appear to be as well dried as the No. 2, and, in spite of interested parties loudly proclaiming it as good as true bark, competent authorities consider it almost inert. In New York there are about 20,000 lbs. of this grade in store, which could probably be had at about 1s. 3d. to 1s. 6d. per lb. c. i. f.

The consumption of cascara is on the increase, both at home and abroad, and we place it to-day at 300,000 lbs. per year. The European demand has increased enormously, and is fully 120,000 lbs. at present.

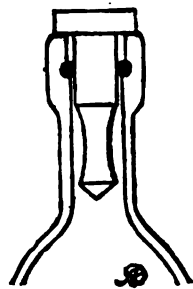
The total stock available in the States to-day of true cascara is less than 1,000 lbs., and a very serious question arises as to what is to be done till next August.

With regard to the new season, we would say that ample supplies will be forthcoming, although at considerably higher rates than formerly. Prices of 1887-'88 were unremunerative to all concerned, and buyers need not expect to see 35s. per cwt. again. Previously the bark could be collected by anybody, but now the owners of the districts where it is obtained, being alive to its value, are already demanding considerable sums for the privilege of gathering. Worst of all, the high price cascara has reached this year will cause the speculator, who hitherto has had nothing to do with it, to watch closely and "corner" the crops, if price goes low enough; in fact, a great many outsiders may be expected to go into the business, and we fear considerable speculation will result.

A NEW BOTTLE-STOPPER.

THE *Bayr. Industrie u. Gewerbeblatt* (1889, 26) describes a new and simple method of closing bottles hermetically.

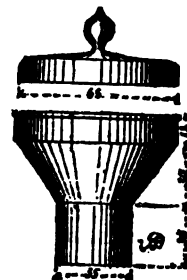
The bottles and stoppers, in this case, must be specially made. The former possess a neck having a circular groove a short distance from the orifice, and slightly contracting towards the anterior. The stopper, which is of glass, has a stout head, to permit its being firmly grasped, and a body the shape of which is best understood by examining the cut. Previous to the insertion of the stopper, a rubber ring of suitable calibre is slipped over the contracted part of the stopper and the latter then pushed into the neck of the bottle. As the outer margin of the rubber ring passes the edge of the neck, it slides upwards along the stopper, until it passes over the straight portion of the body, and on further depression of the stopper, the rubber ring is caught by the circular groove. In this manner a perfect closure of the bottle is accomplished. As there is no *point d'appui* for any moderate pressure of gas, if confined within such a bottle, to exert pressure upon, such bottles may be used for the storage of liquids charged with gas at moderate pressure. When the stopper is pulled out the ring eventually encircles the contracted part of the stopper, and when the latter is entirely withdrawn the slightly expanding end of the stopper helps to prevent the slipping off of the rubber ring.



GLASS CASE FOR FILTERS.

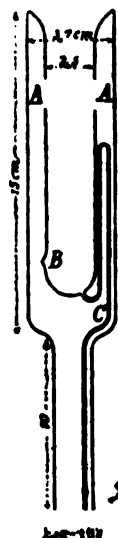
C. REINHART reports that he has used, for some years past, the apparatus here shown for drying and weighing paper-filters. It is a glass box, the upper part of which has the form of a funnel, and which may be closed by a well-ground cover. The filter is first thoroughly dried in the open box, and the latter then closed with the lid, which is, of course, dried in the hot chamber at the same time. After cooling in the desiccator, the whole is weighed. When the filter has been used for collecting precipitates, etc., it is partly dried, until it can be lifted out of the funnel, then transferred to the glass box, and the drying completed. The box is then covered, allowed to cool, and weighed.

As there are often little films adhering to the insides of beakers, funnels, etc., due to minute portions of precipitate which can only be detached mechanically, the author recommends to weigh, together with the original filter, a piece of another one or some clippings of filtering paper, which may afterwards be used for wiping off the adhering film, and which are dried and weighed afterwards with the main filter.—*Zeitsch. f. ang. Chem.*



IMPROVED EXTRACTION APPARATUS.

B. BLOUNT has devised an extraction apparatus, in which the delicate and fragile parts, which are usually situated externally, are placed inside of the outer wall, in fact between two walls, so that the risk of breakage is reduced to a minimum. The accompanying sketch gives the dimensions of the apparatus in cubic centimeters. The upper part of the apparatus is double-walled; between the two walls passes the bent siphon-tube C. The hot vapors from the flask pass up and out, through openings at A, into a condenser to be attached above (but not shown in the cut.) The condensed menstruum (ether, etc.) falls back upon the substance to be extracted, packed in the inner tube, and the saturated liquid is periodically and automatically drawn off by the siphon.—*Anal.*, 1888, 126.



Boric Acid not a Constituent of Milk.

—Since boric acid has been found by Soltien and others to be a regular constituent of the ash of wine solids, its presence has been looked for and partially established in many other ash residues. Lippmann, for instance, found it in the ash of sugar beets (both leaves and root), which is besides remarkable on account of its containing rubidium, caesium, manganese, copper, and vanadium, the presence of which, however, must depend mainly upon the nature of the soil upon which they are grown. Eckenroth has fed cows with beets in which the presence of boric acid had been demonstrated, but was never able to find it in their milk. It is, therefore, certain that it is eliminated by other channels.

Preparation of Dextrin.

ACCORDING to Klepotschewsky, the best process for preparing dextrin is the following:

	Parts
Potato Starch.....	400
Water.....	200
Hydrochloric Acid, sp. gr. 1.14.....	5

Mix them thoroughly, dry the mixture, by exposure to the air, during about two days, at a moderate temperature, then heat the mass, first on a water or steam-bath, and lastly for about half an hour in an oven at a temperature of 110° C.

Dextrin thus prepared leaves a slight residue behind; when it is dissolved in water, it slightly reduces Fehling's solution. But the same is the case also with dextrins made by other processes.—After *Chem. Zeit.*

Tape-Worm Pills.

BETTELHEIM some time ago recommended, as a convenient (?) remedy for tape-worm, to administer a decoction of pomegranate bark by means of an oesophageal tube. But as the remedy often causes nausea, he now recommends to prepare pills of the following, which are to be coated with keratin:

Ethereal Extract of Male Fern.....	160 grains.
Extract of Pomegranate Root Bark.....	160 "
Jalap, powdered.....	48 "

Make 70 pills, and coat them with keratin (which causes them to pass the stomach undigested, while they will be dissolved in the intestinal canal).

An adult patient is to take 15 to 20 of these pills on the "fast-day" preceding the day of treatment. On the latter, he is to take the remainder of the pills, within two or three hours. On the preceding "fast-day," he is also to take a purgative enema.

Hydroxylamine in Skin Diseases.

THE suggestion of Professor Binz to introduce hydroxylamine as a substitute for pyrogallol and chrysophanic acids has been practically taken up by Dr. Eichhoff, who reports enthusiastically on this new drug. He used the following formula:

Hydroxylam. Hydrochlor.....	gr. ij.
Spirit. Vini.....	℥ij.
Glycerin.....	℥ij.

S. For external use.

The affected parts of the skin, after being first washed with soft soap, are painted with this solution from four to five times a day. The alcoholic solution has the advantage of penetrating the skin much more rapidly than if ointments were used as a vehicle. Application of stronger solutions than one per cent requires caution. Hydroxylamine has been used by Dr. Eichhoff for ringworm and the disease in close relation to ringworm called sycosis parasitaria, and also in cases of lupus vulgaris; especially with the latter his success was remarkable. He also recommends the drug for treating psoriasis and parasitic eczema.—*Chem. and Drugg.*

The Solubility of Permanganate of Potassium.

IN the course of an investigation of the constitution of permanganate of potassium, Mr. Charles M. Bradbury made a series of careful experiments to re-determine the solubility of permanganate of potassium in water, and his results deviate more or less from those formerly obtained.

He finds that at 0° C. and 5° C. and between these degrees, the results obtained were extremely uniform, no matter what method of producing a saturated solution was employed. Above 5° C. there was a slowly increasing degree of variation in the results according as the method of making a solution was changed. Nevertheless, below 35° C., the results were not materially different. Above this temperature, however, the difficulties increased. The method employed by the author to produce the saturated solutions upon which the final results were based, was the following:

A flat porcelain dish, about 6 Cm. deep and 25 Cm. in diameter, was covered outside with cotton-wool and heavy paper, and fitted with a wooden cover. The permanganate was placed in a small beaker, in sufficient quantity to insure saturation of the solution, and the beaker was immersed in the bath in the dish through an opening made in the cover to fit it. The temperature of the bath was shown by a thermometer, introduced through the cover, and that of the solution by another suspended in it. Starting at 0° C., the temperature was gradually raised by removing the ice and adding warm water, till 30° C. was reached; from which point the increase was continued by the aid of a jet of steam led through the cover into the bath. At every 5 degrees' rise in the temperature of the solution, 5 O.c. were removed to a weighed vial, which was then set in a steam-bath to evaporate. The solution was stirred, and then given time for the undissolved salt to subside, previous to the removal of each sample.

Following are some of the results obtained:

100 C.c. of a saturated solution of the salt contain

At	Gm. of Salt.	At	Gm. of Salt.
0° C.....	3.0	40° C.....	10.6
5° ".....	3.3	50° ".....	18.7
10° ".....	4.0	75° ".....	23.8
15° ".....	4.9	90° ".....	28.6
20° ".....	5.8	95° ".....	32.8

—After *Chem. News*, March 29th.

Uralium: A New Hypnotic.

GUSTAVO POPPI, a medical student of Bologna, recently described to the Medico-Chirurgical Society of that city the effects of a new hypnotic produced by the combination of chloral hydrate with urethran. From experiments on animals and on the human subject he concludes that this substance—*uralium*—induces sleep more quickly and more certainly than any other known hypnotic. It causes no bad effects of any kind. It has been given in cases of heart disease and nervous complaints with the best results, even when other hypnotics had failed. The *British Medical Journal* says that experienced practitioners will recognize in Signor Poppi's enthusiastic account of his discovery the familiar trumpet-blast that heralds the first appearance of so many new remedies, "which have their day and cease to be," or which, at any rate, soon lose their title to therapeutic infallibility.—*Chem. and Drugg.*

Adulteration of Sherry in Spain.

THERE are two kinds of wine merchants who ought not to be confounded; these are the wine-growers and speculators in wine on the spot, who are in reality those who form the market prices; the others are the "extractors," and these are the shippers to foreign markets; they make their purchases from the former, and prepare and blend their wines in a great variety of styles for the particular demand of the market each kind is intended for. For instance, there are markets which require a very pale sherry, and a gold or brown sherry would not sell at any price, whilst at others it happens the contrary and a very pale wine would not find buyers. There are many other specialties, such as more or less dry, more or less body, sweetness, taste, etc., in fact, each adapted for a different market; but these wines cannot be considered to form the market value of this place, and for said reason it is necessary to take the prices from the first-stated merchants. That is what the shippers do, or pretend to do, when they present their invoices, which represent the original cost of the wine and the corresponding expenses of preparation from the date of the purchase, which appears reasonable.

This is observed in the majority of shipments for New York, where the largest quantity consumed is of very low grade. It has been considered generally that low sherries cannot be fit for shipment until the third year, and so it would be if left entirely to nature; but such wines in the hands of intelligent persons in the matter, by repeated fining and raking off, reinforcing well with alcohol, and other operations adopted by wine merchants, have, in fact, of late been shipped within the second year. A great part of the wine shipped is not above twelve months, and this is the sweet or checked wine, of which a good portion enters into the combination of low sherries.

The sweet wine is made thus: During the vintage, and after the grape is pressed, they put 25 gallons of alcohol or spirits of about 66 per cent overproof to a butt, and the rest is completely filled with the must or juice of the grape, and bung made fast. The spirits stop the fermentation of the wine, which then becomes perfectly sweet. This wine can be got ready for shipment within twelve months or less, but, as I have already stated, it is only used as an auxiliary for the preparation of wines.

In general the low-priced sherries are blended or composed of four or more different sorts, viz., alcohol or spirits, sweet wine, which I have described above, colored wine, cheap new wines of different kinds, and sometimes of a few gallons of older wines to help the whole to an older appearance. Fine sherries, on the contrary, are kept in their natural state of very pale and dry for six or seven years and sometimes longer, and these wines, which, from their first growth, are costly and become still more so by the length of time required, are very frequently disapproved by such as find other sorts of wine more to their taste, and worth, perhaps, the tenth part of the above stated varieties.

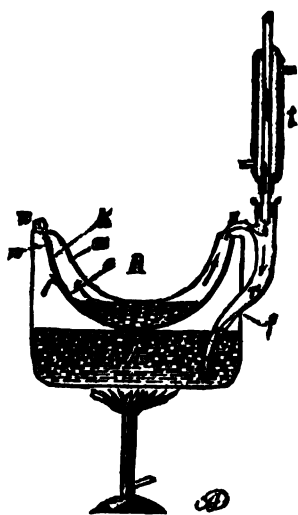
Another way, and the best way, to "forward" wines is by the use of "soleras," or, as I should say, mother-wines. The said soleras are a number of butts of old wines more or less good, but always old; these butts of wine to be made use of are generally half full, the other half being filled with a new wine which, in the course of a very short time, gets so forwarded that it becomes an "old" wine under that treatment. A quantity is then taken from each butt to be made use of in the preparation of wines, and that quantity taken off is again replaced with new wine to let it grow again in the same manner. The same way of carrying on the business is hardly to be found in any other country, or even in any other part of Spain.—*Report of U. S. Acting Vice-Consul ANT. J. BENSUSAN at Cadiz.*

A NEW CONSTANT-LEVEL WATER-BATH.

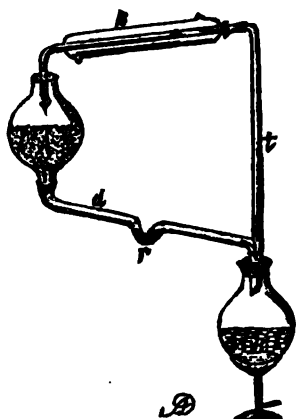
UPON a square-bottomed copper vessel A (see cut) is soldered a semi-globular double-walled copper vessel B. The two chambers can communicate only by the passage shown in the cut, and by a narrow slit in the inner bottom of the vessel R, between the points marked respectively *k* and *e*. At U a tubulure is situated, through which the vessel A may be filled until the liquid just touches the bottom of the upper curved vessel. When heat is applied, the generated steam is compelled to make its way (in the direction of the arrows) through the before-mentioned slit, and coming in contact with the cooler walls of the double chamber, is partly condensed, and partly carried forward, until it is returned to a liquid state by passing up the condenser *t*, whence it flows back into the chamber A. Not only is there a constant level preserved, but the apparatus has the further advantage that the liquid to be evaporated does not come at all in contact with vapors arising from the water-bath. The apparatus has been devised by Mr. P. N. Raikow.—*Chem. Zeit.* and *Chem. Centralbl.*

A NEW DRYING-OVEN.

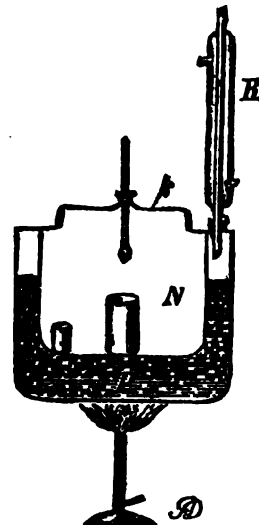
THIS is constructed somewhat on the principle of the constant-level water-bath designed by the same chemist, viz., P. N. Raikow, at least so far as there is a condenser connected with the apparatus, which prevents the escape of vapors. The oven is a square two-walled box, which, instead of a door at the side, has a lid on top, through which passes a thermometer.—*Chem. Zeit.* and *Chem. Centralbl.*



Raikow's water-bath.



Raikow's ether-extractor.



Raikow's drying-oven.

A NEW ETHER-EXTRACTOR.

THE apparatus here described is proposed by P. N. Raikow.

B is the flask to which heat is applied. The vapors of the menstruum rise through *t*, pass into the condenser *k*, and from there the condensed liquid falls upon the substance to be extracted, which is contained in the extraction vessel A, whence the saturated liquid runs down the tube *d*, which is provided with a trap *r*, the object of which is to prevent the passage of the hot vapors in the direction of *r d*.—*Chem. Zeit.* and *Chem. Centralbl.*

On Hygrine.

REGARDING the nature, and even the very existence, of *hygrine*, the reputed companion of cocaine in coca leaves, there have existed up to the present time very diverging opinions. Even Hesse, who might have been supposed to have special facilities for collecting such a by-product, only succeeded in collecting a few grammes, which were manifestly insufficient to make a thorough study of the substance. Prof. C. Liebermann, however, has had a better opportunity, having received from his friend, Dr. Giesel, about one pound of the substance, which had been obtained by Lossen's process with only slight modifications.

Hesse assigned to *hygrine* the composition $C_{11}H_{11}N$, and regarded it as trimethyl-quinoline. Liebermann, however, finds that it is a complex mixture of oxygenated bases, provided that his own and Hesse's "*hygrine*" were identical.

The *hygrine* examined by Liebermann appeared in form of a dark-colored, oily liquid, of an odor resembling piperidine and nicotine, having a strongly alkaline reaction and almost wholly soluble in water. As it is liable to suffer decomposition when overheated, Liebermann treated it in the following manner:

The crude material was dissolved in absolute ether, the ethereal solution separated from a layer of water which collected below, and sticks of solid potassa added to it so as to absorb the rest of the water and any carbonic acid

which had been attracted from the air. This solution was freed from ether by distillation, and the residue distilled under a vacuum of 45 to 50 millimeters of mercury, under which circumstances the bases passed over undecomposed. It was soon noticed that the latter passed over in two main portions, one boiling (at 50 Mm. pressure) at 128° – 131° C., the other at about 215° C. There not being enough material to examine other fractions, Liebermann restricted his examination to the two main portions.

The lower boiling base was found to have the composition $C_{11}H_{11}NO$. The higher boiling one has probably the composition $C_{11}H_{11}N_2O$.

It is evident, therefore, that the statements heretofore made regarding *hygrine* will have to be corrected.

Antipyrin and Spirit of Nitrous Ether.

A VALUABLE contribution to our knowledge of the reaction occurring between antipyrin and nitrous ether has been furnished by Drs. H. C. Wood and John Marshall. They have gone thoroughly into the chemistry of the subject, preparing the iso-nitroso-antipyrin by adding the calculated quantity of potassium nitrite to an acidulated aqueous solution of antipyrin. The liquid became at once bluish green in color, and in a few minutes there was abundant production of crystals. It was noticed that the filtrate from the crystals changed in color from green to brown, and developed a very distinct hydrocyanic acid odor after standing a few hours. The presence of cyanogen was proved, and it was further ascertained that dilute sulphuric acid, hydrochloric acid, and acetic acid upon solutions of iso-nitroso-antipyrin, causing the evolution of cyanogen. The same is the case with mix-

tures containing spirit of nitrous ether and antipyrin. The decomposition may occur in the stomach, and this was demonstrated by adding iso-nitroso-antipyrin to a 0.2 per cent solution of hydrochloric acid, and keeping the whole at the temperature of the body in a water-oven. The quantity of cyanogen evolved is, however, so slight that no danger need be feared. The amount given off in an hour from 0.5 Gm. of iso-nitroso-antipyrin, mixed with 50 C.c. of the 0.2 per cent acid solution, is only sufficient to give a few crystals of argentic cyanide with argentic nitrate on an inverted watch-glass, equivalent, possibly, to less than one hundred-thousandth part of a grain of hydrocyanic acid. In determining whether the iso-nitroso-antipyrin possessed toxic properties, it was administered under various conditions to dogs and rabbits, but in no case were the slightest untoward effects observed.—Abstract from *Therap. Gaz.* in *Chem. and Drugg.*

Treatment of Sea-sickness.

DR. SKINNER is one of the latest claimants of a cure for sea-sickness. He reports that he has obtained good results by the simultaneous employment of atropine and strychnine, or by that of caffeine. He used the following solutions (proportions recalculated from metric formula):

- | | | |
|----------------------------|----------|----|
| I. Atropinæ Sulphatis..... | gr. | † |
| Strychninæ Sulphatis..... | gr. | † |
| Aquæ Menth. Pip..... | fl.drch. | 10 |

To be used hypodermically.

- | | | |
|------------------------|-----|-----|
| II. Caffeinæ..... | gr. | 64 |
| Sodii Salicylatis..... | gr. | 48 |
| Aquæ Destillatæ..... | ℥ | 160 |

Dissolve with the aid of a gentle heat. To be used hypodermically.

In the majority of cases, the administration of 1 Gm. of either solution allays vomiting, dispels nausea, headache and dizziness, and causes quiet sleep in from one-half to three-quarters of an hour. Pills prepared with the two alkaloids of formula No. I. and taken at the first approach of the symptoms of the disease, prevent its development.—*Med. Chir. Rundschau, J. de Pharm.*

"Commercial" Lard.

THE lard trade of America has assumed very large proportions. It was stated in evidence before a commission recently appointed by the United States House of Representatives to inquire into the question of lard adulteration, that about 270,000 tons are annually produced in America, upwards of one-half of which is exported to other countries. Amongst the American lard packers there are several who prepare and supply only pure lard, but it was stated before the same commission by one of the largest producers that three-fourths of the American lard was packed by his firm and a few other large firms, and that these firms, "in order to keep up the quality and to meet the demands of the trade, added cotton-seed oil and oleomargarin-stearin" to their lard. This lard is all branded and sold as "Refined Lard," "Pure Refined Lard," and by other names calculated to lead the purchasers to believe that the lard is genuine, pure lard. The cool way in which this perversion of the ordinary meaning of the word "Refined" is defended, is amusing. To the question, "Do you think that if there were only 20 per cent of lard in your compound, it would be right to brand that as refined lard?" the same witness answered, "Yes, sir. After we have been putting up lard for 25 years, we claim to become expert in the manufacture of an edible lard for domestic purposes. If we consider that we can make an article that meets the demand of our trade, fulfils the wants of the trade, and is pure and wholesome and valuable, and can put in 50 or 60 per cent of cotton-seed oil and harden it with 20 per cent of lard (beef stearin?) to make it firm, it meets the demand of our trade. That is all they want. We know what they want better than they do themselves. . . . If we choose to say we are willing to put in our brand of refined lard only about 20 per cent of lard, we consider it perfectly fair to do it."

The beef stearin used is a by-product of the margarin manufacture, and consists of the harder part of the beef fat from which the oleomargarin has been separated by pressure. Its price was recently about 36s. per cwt. The price of cotton-seed oil was about 23s. per cwt. The price of lard was about 47s. per cwt. It will thus be seen that there would be a large margin of profit if a compound consisting of 50 or 60 per cent of the cheaper cotton-seed oil and beef stearin could be sold at the price of genuine lard; and this is probably the clue to the true explanation of the adulteration.

Lactate of Quinine for Hypodermic Use.

At a recent meeting of the Paris Society of Pharmacy, M. Vigier read a note on lactate of quinine for hypodermic injections. The combination—an excellent one for the purpose—seems to have fallen into an unmerited discredit, because the chemical supplied by dealers is not soluble in three times its weight of water, as the Codex says, but requires ten times. M. Vigier said the sparing solubility is owing to the use of the crystallized lactate. A good plan is for the pharmacist himself to prepare his lactate solution, and to keep it as such. The following formula is a convenient one:

	Grammes or parts.
Sulphate of Quinine.	21.85
Water.....	400.00
Sulphuric Acid (10 per cent).....	25.00
Ammonia.	15 to 20.00
Lactic Acid.....	sufficient or 5.00

Dissolve the sulphate of quinine in the sulphuric acid and water, precipitate with the ammonia, wash, collect the alkaloid magma in the usual manner, and, while it is still moist, place it in a porcelain dish with about 100 grammes of water heated to 80° C. Now saturate it with sufficient lactic acid, evaporate the liquor to 100 grammes and filter. Keep for use in a vial closed with a glass stopper dipped in paraffin.

The solution contains for each 5 grammes (or parts), 1 gramme (or part) of lactate of quinine, and will keep unaltered for years.

At the same time M. Vigier added that recently a manufacturer of chemicals, having heard of his researches on quinine lactate, sent him a specimen of the chemical guaranteed to be pure and to dissolve in three times its weight of water. The salt was soluble as claimed, but its purity had not yet been tested. A noticeable feature was that the lactate in question is not crystallized, but amorphous. The worst about it, however, is that 20 centimes a gramme was the price charged, while the home-made solution costs only one-fifth of the amount. Consequently, pharmacists are strongly advised to make their lactate themselves.

While the solubility of quinine lactate was under discussion, the general opinion prevailing was that the salt becomes less soluble on being evaporated and crystallized; also that much of the lactate offered by wholesalers is merely sulphate dampened with a little lactic acid. The statement of the Codex respecting the solubility of quinine lactate having been found fault with, Professor Marty, who was on the Pharmacopœia Committee, remarked that they had at the time apparently good reason for what they had said. A specimen of crystallized lactate supplied

by Milan manufacturers did answer this test. Professor Jungfleisch had been informed that the chemical was made by saturating an ethereal solution of quinine alkaloid with lactic acid, dissolved also in ether, and evaporating without heat. The truth of the statement could not be ascertained at the time, and consequently no process was given in the Codex. But, on the whole, it agrees well enough with the facts elicited during the discussion.—*Chem. and Drugg.*

Improvement in the Manufacture of High-grade Glucose.

COMMERCIAL glucose usually consists of about 66 per cent of fermentable sugar, 18 to 20 per cent of unfermentable, organic constituents, the rest being water. The low percentage of dextrose has hitherto prevented its practical employment in many branches of industry. This drawback is likely to be overcome by the improved process for preparing grape-sugar, devised by Alfred Seyberlich, of Riga. One of the main improvements in this process is the use of nitric in place of sulphuric or other acids. Nitric acid had, indeed, been already recommended by others, but no practical results appear to have been attained by them.

The new process is carried on in open boilers without pressure. The relative proportions of ingredients are:

Starch.....	100 parts
Water.....	200 "
Nitric Acid.....	1 per cent

of the starch (from rice, Indian corn, etc., etc.) calculated as air-dry. •

These ingredients are boiled in the usual manner, the liquid then neutralized, rendered faintly alkaline, and filtered by means of a filter-press. The resulting filtrate is evaporated to a density of 35° B. (taken while hot), and transferred at a temperature of 18° C. (65° F.) to copper pans, where it is frequently stirred and allowed to crystallize. The crystalline mass is pressed in coarse linen bags, yielding cakes which contain about 88 per cent of pure sugar, 10 p. c. of water, and 2 p. c. of impurities. This is "raw sugar."

The clear syrup, which has been removed by pressing, is repeatedly concentrated, so as to obtain more crystals, and the final molasses freed from nitric acid and salts by means of sulphurous acid.

For the purpose of refining the raw sugar, the cakes are melted in a copper boiler, with the addition of enough water to make a solution of the density of 32° B. (while hot). For every 100 parts of sugar 10 parts of animal charcoal are then added, the whole well stirred and heated to 80° or 90° C., and afterwards passed through the filter-press. The resulting colorless syrup is set aside to crystallize, yielding a brilliant white, crystalline mass, which is freed from mother-water by pressure. The latter is again concentrated and a fresh crop of crystals obtained.

If the sugar thus refined and pressed is crushed or ground, the product will form a salable, white, crystalline "farina-sugar." To obtain larger and better developed crystals, the cakes are melted on a water-bath at 80° to 90° C., the melted mass poured into the usual forms, and allowed to crystallize during 48 hours at 18° C. When the mass is dry it represents pure hydrous glucose, containing 90 per cent of dextrose and 10 per cent of water.

Anhydrous, or practically anhydrous, glucose is prepared by melting the hydrous cakes over an open fire to boiling, cooling, adding a few crystals of anhydrous grape-sugar, and allowing to stand 24 hours. The resulting crystals contain 98% of glucose and 2% of water. By crushing and sifting this, a product is obtained which is very similar to cane-sugar.

The author states that 100 parts of anhydrous starch will yield from 95 to 100 parts of glucose.—After *Dingler's Pol. J.*, 271, 512.

Oil of Eucalyptus in Phthisis.—Dr. Philip recently reported to the Edinburgh Medico-Chirurgical Society that he had for eighteen months employed eucalyptus oil in conjunction with cod-liver oil in the treatment of phthisis, and had obtained good results. The oils were administered as an emulsion, devised for him by Messrs. Baildon & Son, which contained 75 per cent of cod-liver oil and 5 minims of eucalyptus oil in each drachm. The latter disguises the taste of the cod-liver oil in a remarkable degree.—*Chem. and Drugg.*

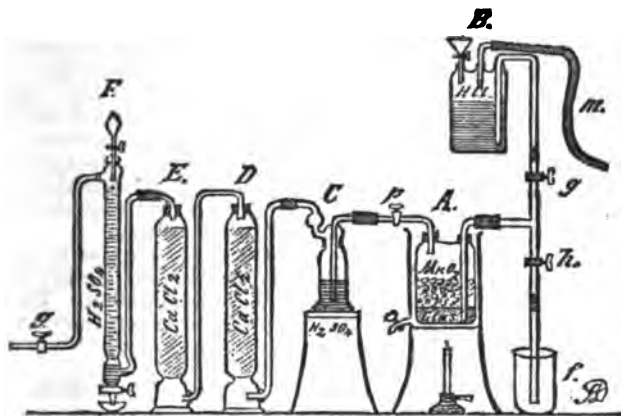
Voice Lozenge.—According to the *Chem. and Drugg.*, Dr. Hinkle recommends the following formula as the best for a "voice lozenge" in the ordinary hoarseness of singers and speakers. A small piece should be allowed to dissolve in the mouth just before vocal exertion:

Cubebs.....	1 grain.
Benzoic Acid.....	"
Hydrochlorate of Cocaine.....	1/16 "
Powdered Tragacanth.....	1/2 "
Extract of Licorice.....	5 grains.
Sugar.....	13 "
Eucalyptol.....	1 minim.
Oil of Anise.....	1/16 "
Black Currant Paste.....	enough to make 20 grains.

A CONTINUOUS CHLORINE GENERATOR.

THE apparatus here described has been devised by A. Vosmaer, and is suitable for a continuous generation of chlorine gas.

The generator A consists of a two-necked Woulf's bottle, the bottom of which is covered with a layer of coarse pieces of glass or pumice, over which is placed a layer of best manganese dioxide in pieces of about the size of a pea. The hydrochloric acid requisite for generating chlorine gas is supplied by a siphon from a reservoir B situated at a higher level. A water-bath surrounds the Woulf's bottle, so as to permit the application of the proper degree of heat. The cylinders C and F contain sulphuric acid, and the two intermediate ones, D and E, chloride of calcium in lumps, all of which serve to thoroughly dry the gas.



When the apparatus is to be set at work, stop-cock *h* is closed, and *p* and *g* are opened, whereupon acid will flow from the reservoir into the generator. This may be hastened by blowing through the tube *m*. The amount of chlorine gas given off may be regulated by the size of the gas-flame. When the current is to be interrupted, the stop-cocks *p* and *g* are closed, and *h* is opened, whereby the liquid in the generator is driven over by the pressure of gas into the beaker *f*, from which it may be re-transferred to the reservoir, if it be still of proper condition.—*Zeitsch. f. anal. Chem.*, 1888, 638.

Fatal Poisoning by Carbon Monoxide.

PROF. W. P. MASON reports a remarkable case of poisoning by carbon monoxide in the *Journal of the Amer. Chem. Soc.*

In Troy, N. Y., on January 6th, 1887, owing to a break in the street mains, a quantity of "fuel gas" (see analysis below) passed beneath the frozen crust of earth and found its way into the adjoining houses. Three deaths and many more or less serious illnesses resulted.

The following points from the testimony of the physicians who made the autopsies are to be noted:

The expressions of the deceased were placid. One victim, an old woman, was found seated in a chair holding her false teeth in her hand. The second, also a woman, lay upon the floor. The third, a man, sat upright on a lounge, his head reclining on his shoulder. The fire was burning in the stove, and the lamps were still burning on the table. When found, death had not been very recent, as *rigor mortis* was fully developed.

Very searching autopsies were made, with the result of finding nothing whatever abnormal, with the exception of the bright cherry-red color of the tissues, and the vivid redness and lack of coagula in the blood.

Upon opening the chest cavity the physician bent forward and took one or two long whiffs for the purpose of determining the presence of any odor. Almost immediately he was seized with giddiness and great oppression in the epigastrium, so much so that he had to discontinue his work for half an hour. The effects did not finally wear off until after an interval of about twelve hours.

The painful oppression in the chest, the giddiness, and the subsequent headache experienced by this physician call most forcibly to mind the symptoms described by Sir Humphry Davy when he so rashly experimented upon himself with carbon monoxide.

A lawsuit naturally growing out of these cases of poisoning, I was called upon to give the chemical constituents found in the said "fuel gas," and the results are appended. I also experimented upon animal life with carbon monoxide mixed with air, obtaining results confirmatory of observations already made, that death usually takes place very quietly, although occasionally with convulsive movements. Chickens and rats were the two forms of life employed.

Blood, treated with carbon monoxide, I found to assume a bright red, almost carmine, color, which did not alter on exposure to air for a number of days.

Finally, in February, 1888, a bottle of blood taken from

the heart of one of the victims at the time of the autopsy was submitted to me for examination. The bottle was closed with a tight cork. Although over a year old, and possessing strong odor of decomposition, the color still remained of the brilliant, vivid red noted at the time of taking the specimen. Under the microscope but very few corpuscles remained to be seen, their structure having almost completely broken down.

Examination by the spectroscope revealed the two absorption bands near the line characteristic of the presence of carbon monoxide in combination. These bands, although very like those indicative of oxy-hæmoglobin, may yet be readily distinguished by their location only, particularly if a sample of blood artificially treated with carbon monoxide be at hand for purposes of comparison.

The space between the bands is, moreover, much less clearly lighted than in the case of oxygenated blood. As a confirmatory test, the blood under examination was treated with solid potassium sulphide, and the absorption bands found unchanged thereby—the bands of oxy-hæmoglobin, as is well known, change under such treatment to the single dark band midway between the positions of the former ones.

What is of special interest in this case is the ready detection of carbon monoxide in the blood after so long an interval of time.

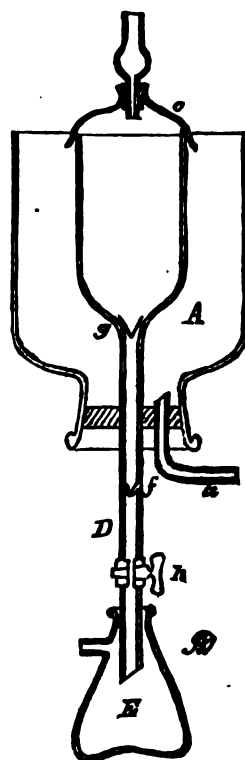
At the present moment, nearly two years from the date of the accident, the blood still retains the characteristics noticed when first examined.

CRYSTALLIZATION BY COLD.

WHEN it is desired to cause the separation of crystals from the solvent liquid by means of cold, under conditions which make it possible to exclude moisture or air, and to free the crystals from adhering mother-liquid, the apparatus devised by J. W. Bruehl may be used.

This consists of a vessel A (of the shape of an inverted wide-mouthed bottle without bottom), the neck of which contains a doubly perforated rubber stopper, one perforation containing the drainage tube *a*, while through the other passes the stem of the glass freezing vessel. This stem is composed of two glass tubes fused together at *f*, the upper one being drawn out to a point, while the lower one contains a stop-cock *h*. The freezer (inside of A) is provided with a hermetically fitting glass cover *c*, which bears a chloride of calcium tube on top, and is closed with a piece of rubber tubing and pinch-cock. At *g*, a small platinum cone is inserted in the neck.

When the apparatus is to be used, it is connected with a receiver E, which itself is connected with the air-pump. A few drops of the liquid are first poured into the freezer so as to cause the platinum cone to adhere to the wall about the neck; then, the stop-cock *h* being closed, the vessel E is filled, and the cover tightly put on. The whole vessel is now pushed down into A as far as possible, and the freezing mixture carefully piled or packed around it. When the solidification or crystallization is completed, the chloride of calcium tube on top of the lid is connected with a supply of dry air, the faucet *h* opened, and the liquid portion drawn off by means of the air or filter pump. The current of dry air (or any other gas) may be passed through, until the crystals are dry. [If the crystals have a tendency to melt readily, the current of air may previously be cooled.]—*Ber. D. Chem. Ges.*, 1889, 236.



A Mexican Medical Man is causing a great commotion in Lima just now, according to a note in the *Chem. and Drugg.* Dr. Castellanos is the name he goes by, and he professes to hold some wonderful secret for diagnosing and expelling tapeworms. He has performed innumerable successful operations, and his receipts are nearly one thousand silver soles per day. By an observation of the patient's eyes he discovers the presence of the worm, and accurately estimates its dimensions. The great dons of medicine look upon him as a charlatan, and talk of punishing him for practising without a license, but they are jealous of his skill, say the daily records. From Lima Dr. Castellanos will proceed to Chili, and from thence to Paris, where he will compete for the great medical prize of 300,000 francs, won previously by Pasteur. Then we are to have him in England [and, of course, also in Uncle Sam's dominions].

Methods of Milk Analysis.

THE following is taken from the Proceedings of the Fifth Annual Convention of the Association of Official Agricultural Chemists, held at Washington in August, 1888, and contains the "Official Methods of Analysis of Milk."

Estimation of Water.

From a weighing-bottle take 5 C.c. milk, put in a weighed thin glass dish, or dish lined with tin-foil, one-third full of powdered asbestos; dry for two hours at 100° C. The temperature obtained in a boiling water-bath does not reach 100° C. The milk should be dried in an air-bath, the temperature of which is carefully controlled.

Alternate Method of Estimating Water.

Evaporate 1 to 2 Gm. of milk in a shallow watch-glass or platinum dish on the water-bath for thirty minutes. Dry for an hour at 100° C. and weigh.

Estimation of Casein.

Take 5 Gm. of milk in a Kjeldahl apparatus with 20 C.c. H_2SO_4 , and estimate ammonia in the usual way.

Alternate Method of Estimation of Casein.

Rub up in a mortar the thin disc containing the dried residue from the above process, or remove the foil containing it, and transfer to the soda-lime combustion tube in the usual way.

The mortar and pestle must be well cleaned with the soda lime, and these cleanings placed in the tube.

Or the dish or tin-foil and its contents may be transferred to a digestion flask, and the casein estimated by the method of Kjeldahl.

Estimation of Fat.

Method of Adams.—The kind of paper and the method of using it first proposed by Adams are as follows:

As for material, the only extra article is some stout white blotting-paper, known in the trade as "white demy blotting, mill 428," weighing 38 pounds per ream. This should be in unfolded sheets, machine-cut into strips 2½ inches wide and 22 inches long; each sheet in this manner cut into seven strips.

I have tried other papers, but none have answered so well as this; it is very porous and just thick enough. Each of these strips is carefully rolled into a helical coil, for which purpose I use a little machine made by myself, consisting of a stout double wire, cranked twice at right angles, and mounted in a simple frame. One end of the strips being thrust between the two wires, the handle is turned, and the coil made with great facility. This may be done, for the nonce, on a glass rod the size of a cedar pencil. Two points have to be carefully attended to; the paper must not be broken and the coil must be somewhat loose, the finished diameter being a little under an inch. I am in the habit of rolling up a considerable number at a time, and placing each within a brass ring as it is rolled, inscribing on one corner with a lead-pencil its own proper number.

These coils are next thoroughly dried, and I need hardly say the accuracy of the process depends on this drying. This can be satisfactorily done in an ordinary air-bath at 100° C., providing the bath be heated properly and the paper kept in it long enough. I have found the common way of heating the thin bottom of the bath with a single jet not to answer. My bath is placed upon a stout iron surface, which is heated by a large ring of jets; in this way the heat is evenly distributed over the whole of the bottom of the bath, and the papers, which are put in a cage frame of tinned iron wire 5 by 2½ inches, and divided into eight partitions, get evenly and completely dried, if allowed to remain in the bath all night, and weighed in a weighing-tube next morning, and their weights having been registered according to their numbers, stored away ready for use, as follows:

The milk to be examined is shaken, and with a pipette 5 C.c. are discharged into a small beaker, 2 inches high by 1½ inches in diameter, of a capacity of about 30 C.c., weighing about 12 Gm. This charged beaker is first weighed, and then a paper coil gently thrust into the milk very nearly to the bottom. In a few minutes the paper sucks up nearly the whole of the milk. The paper is then carefully withdrawn by the dry extremity of the coil and gently reversed and stood, dry end downwards, on a clean sheet of glass. With a little dexterity all but the last fraction of a drop can be removed from the beaker and got on the paper. The beaker is again weighed and the milk taken got by difference. It is of importance to take up the whole of the milk from the beaker, as I am disposed to consider the paper has a selective action, removing the watery constituents of the milk by preference over the fat.

The charged paper is next placed in the water-oven on the glass plate, milk end upwards, and rough dried. Mismanagement may possibly cause a drop to pass down through the coil on to the glass. This accident ought never to occur; but if it does, it is revealed in a moment by inspection of the surface of the glass, and the experiment is thereby lost.

In about an hour it is rough-dried and in a suitable condition for the extraction of the fat.

The method of Adams has been thoroughly tried by the English chemists, and has received the approval of the English Society of Public Analysts. It gives uniformly about 0.2 per cent more fat in normal milk than the ordinary gravimetric methods.

The following modifications of the process may be used:

The blotting-paper is replaced by thick filtering-paper cut into strips two feet long and 2.5 inches wide. These are thoroughly extracted by ether or petroleum or alcohol.

One end of the strip of paper being held horizontally by a clamp or by an assistant, 5 C.c. milk are run out by a pipette from a weighing-bottle along the middle of the strip of filtering-paper, being careful not to let the milk get too near the ends of the paper, and to secure an even distribution of it over the whole length of the slip. The pipette is replaced in the weighing-bottle and the whole re-weighed, and thus the quantity of milk taken is accurately determined. The strip of paper is now hung up over a sand-bath in an inclosed space, high enough to receive it, where the air has a temperature of 100° C. (circa). In two or three minutes the paper is thoroughly dry. It is at once, while still hot, rolled into a coil, and placed, before cooling, in the extraction apparatus already described.

The fat is dissolved by ether or petroleum, collected in a weighed flask, and, after thorough drying, weighed.

The fat after extraction may also be estimated volumetrically as described in the method of Morse.

From data which have been collected, it appears that the estimation of the fat in milk by the lactocrite is strictly comparable with the results of Adams' method. Those who have this instrument, therefore, can use it instead of the method given.

Alternate Method of Estimating the Fat in Milk.

Method of Morse, Piggot, and Burton.—This method consists in the dehydration of the milk by means of anhydrous sulphate of copper; the extraction of the fat by means of the low-boiling products of petroleum; the saponification of the butter by means of an excess of a standard solution of potassium hydroxide in alcohol; and the determination of the excess of the alkali by means of a solution of hydrochloric acid. The following apparatus and reagents are required:

1. A porcelain mortar and pestle.
2. An extraction-tube, 14 or 15 Mm. in diameter, 220 Mm. in length, with funnel-shaped top. A straight chloride-of-calcium tube may be used for this.
3. A 200 C.c. Erlenmeyer flask, strong enough to be used with a filter-pump.
4. A suitable stand for holding the flask and extraction-tube.
5. Ten C.c. pipettes.
6. Weighing-glasses with ground-glass stoppers.
7. A low-boiling gasoline, distilling between 30° and 0° C.
8. Dehydrated sulphate of copper.
9. Semi-normal solution of potash in 95 per cent alcohol.
10. A semi-normal solution of hydrochloric acid.

Manipulation.—Place about 20 Gm. of the anhydrous copper sulphate, roughly measured in a copper spoon of the size to hold about that amount, in a porcelain mortar; make a cavity in the centre of the mass with the pestle. Allow 10 C.c. of the milk to run on to the copper sulphate, being careful that none of it touches the sides of the mortar. When the milk is nearly dry, grind the mass up with a little clean sand, transfer to the extraction-tube, gently pressing it down in the tube by means of a glass rod, the lower portion of the extraction-tube to be packed with clean cotton-wool. The fat is extracted in the following way: 15 C.c. of benzine are poured over the material in the extraction-tube and drawn down, with the aid of the filter-pump, until the whole of the mass to be extracted has become wet with the liquid, when the connection with the pump is closed; after about five minutes another portion of the 15 C.c. of benzine is poured into the tube and the whole of the liquid slowly drawn through with the aid of the pump into the flask. Usually one extraction of this kind is sufficient to withdraw the whole of the butter, but for the sake of greater accuracy the process may be repeated two or three times.

Titration.—The benzine may be evaporated, and the residual butter fat saponified with about 25 C.c. of the approximately semi-normal potash. The residual alkali is determined by means of the semi-normal hydrochloric acid, using phenolphthalein as indicator. The difference between the amount required in this process and the amount necessary to neutralize the quantity of alkali taken gives the amount of alkali required for the saponification. The number of Mg. of potash required for one Gm. of the fat is taken at 230. The fat may also be accurately titrated without evaporating the benzine.

Alternate Method of Estimating Water and Fat in Milk.

Method of Babcock.—In the bottom of a perforated test-tube is placed a clump of clean cotton; the tube is then filled three-quarters full of ignited asbestos, lightly packed, and a plug of cotton inserted over it. The tube and contents are weighed, and the plug of cotton carefully removed, and 5 Gm. of milk from a weighed pipette run

into it, and the plug of cotton replaced. The tube connected at its lower end by a rubber tube, and adapted with a filter-pump, is placed in a drying-oven at 100° C., and a slow current of dry air drawn through it until the water is completely expelled, which in no case requires more than two hours.

The tube containing the solids from the above operation is put in an extraction apparatus, and exhausted with ether in the usual way.

Alternate Method of Estimating Water and Fat.

Method of Professor Macfarlane.—A glass tube, 4 to 5 C.c. in length and 2 Cm. in diameter, open at one end, drawn out to a tube 5 Mm. in diameter at the other end, is two-thirds filled with asbestos fibre, such as is used in manufacturing packing. It is dried in the water-bath for several hours, cooled in the desiccator, and weighed. Ten C.c. of the milk are then added from a pipette, which is completely absorbed by the asbestos. It is then weighed, the additional weight of the milk representing the amount taken. The tube, along with many others, is placed in a water-bath with constant level, and dried for ten or twelve hours (during the night) at a temperature of 90°. Next morning, the tubes are cooled in the desiccator and weighed, the loss in weight being the moisture. The tubes are then placed in the Soxhlet extraction apparatus, and exhausted with petroleum ether for four hours. They are then removed and dried in a steam bath, cooled in desiccator, and weighed. The loss represents the butter fat.

The Estimation of Sugar.

The reagents, apparatus, and manipulation necessary to give the most reliable results in milk-sugar estimation are as follows:

Reagents.—1. Basic plumbic acetate, specific gravity 1.97: Boil a saturated solution of sugar of lead with an excess of litharge, and make it of the strength indicated above. One C.c. of this will precipitate the albumen in 50 to 60 C.c. of milk.

2. Acid Mercuric Nitrate: Dissolve mercury in double its weight of nitric acid, specific gravity 1.42. Add to the solution an equal volume of water. One C.c. of this reagent is sufficient for the quantity of milk mentioned above. Larger quantities can be used without affecting the results of polarization.

3. Mercuric Iodide with Acetic Acid: KI 33.2 Gm.; HgCl₂ 13.5 Gm.; HCl·H₂O 20 C.c., H₂O 64 C.c.

Apparatus.—(1) The room and milk should be kept at a constant temperature. It is not important that the temperature should be any given degree. The work can be carried on equally well at 15° C., 20° C., or 25° C. The slight variations in rotatory power within the above limits will not affect the results for analytical purposes. The temperature selected should be the one which is most easily kept constant.

(2) The specific gravity of the milk is determined. For general work this is done by a delicate specific gravity flask.

(3) If the specific gravity be 1.026, or nearly so, measure out 60.5 C.c. into the sugar flask. Add 1 C.c. of mercuric nitrate solution, or 30 C.c. mercuric iodide solution, or fill to 102.4 mark. The precipitated albumen occupies a volume of about 2.44 C.c. Hence the milk solution is really 100 C.c. If the specific gravity is 1.030, use 60 C.c. of milk. If specific gravity is 1.034, use 59.5 C.c. of milk.

(4) Fill up to mark 102.4 C.c. in flask, shake well, filter, and polarize.

Notes.—In the above method of analysis the specific rotatory power of milk-sugar is taken at 52.5, and the weight of it in 100 C.c. solution to read 100 degrees in the cane sugar scale at 20.56 Gm. This is for instruments requiring 16.19 Gm. sucrose to produce a rotation of 100 sugar degrees. It will be easy to calculate the number for milk-sugar, whatever instrument is employed.

Since the quantity of milk taken is three times 20.56 Gm., the polariscopic readings divided by three give at once the percentage of milk-sugar when a 200 Mm. tube is used.

If a 400 Mm. tube is employed, divide reading by 6; if a 500 Mm. tube is used divide by 7.5.

Since it requires but little more time, it is advisable to make the analysis in duplicate and take four readings for each tube. By following this method gross errors of observation are detected and avoided.

By using a flask graduated at 102.4 for 60 C.c. no correction for volume of precipitated casein need be made. In no case is it necessary to heat the sample before polarizing.

In the above method no account is taken of the fat which is retained on the filter with the casein. It is worth while to inquire if a correction similar to that made for the albuminoids should not also be made for the fat.

Estimation of Ash.

Evaporate to dryness in a weighed platinum dish 20 C.c. of milk from a weighing-bottle, to which 6 C.c. of HNO₃ have been added, and burn in muffle at low red heat until ash is free from carbon.

New Solvents of Prussian Blue.

GUIGNET has found that molybdic acid dissolves a large proportion of Prussian blue. Water is heated to boiling, and to this is added a mixture of Prussian blue and molybdic acid, when solution will soon take place. [The author does not give the proportions, but his statements leave it to be inferred that only a small quantity of molybdic acid is needed. At all events, it will be easy to determine the limit.] On filtering, a deep blue liquid is obtained, which is not altered by the further application of heat, and forms no precipitate with gelatin. Addition of sulphuric, nitric, or other acids, however, produces a precipitate. If this is well washed in weak alcohol, it may be redissolved in water.

Molybdate of ammonium and tungstate of ammonium are likewise good solvents of Prussian blue.

Vanadium Ink.

SINCE Berzelius' statement (1835) about the preparation of a superior black ink by adding a little vanadate of ammonium to a decoction of galls, this process has been quoted in all technological hand-books, being evidently one of those which had not been practically tested. Carl Appelbaum recently reported that there is a mistake about this process, nothing in the shape of ink being thereby obtainable.

But an ink which may be useful in certain cases can be prepared as follows:

Dissolve 10 parts of tannic acid in 100 parts of water, and 0.4 part of vanadate of ammonium in 10 parts of water. Mix the two solutions, and shake moderately.

This ink flows with a deep-black color from the pen, without spreading or striking through the paper, although it contains no gum. It has a pleasant gloss, cannot be copied, dries quickly, and, even if the writing is laid in water for 24 hours, does not change its black color. It is very useful for writing addresses of letters, postal cards, etc., when used fresh. Dilute acids do not alter it, but solutions of chlorinated potassa (or soda) bleach it completely. After a few weeks the tint of the ink begins to change, writing executed with it becomes lighter and somewhat yellowish, and in about three months the change is completed, when it has a foxy yellow tint. The writing is still plainly legible, however, and cannot be removed either by water or by acids.—*Dingl. Polyt. J.*, 271, 423.

On the Separation of Strychnine from Brucine.

J. E. GEROCK has discovered a new and apparently very satisfactory method for separating strychnine from brucine. On studying the effect of nitric acid of varying strength upon the two alkaloids, he found that strychnine was far more resistant towards it than brucine. Upon the basis of a long series of experiments, it was ascertained that nitric acid of sp. gr. 1.056, although it assumes a yellow color when it is brought in contact with strychnine, yet does not alter the alkaloid chemically, while the same acid will, with the aid of heat, form with the brucine a yellow solution, which no longer contains the alkaloid.

The author also found that the picrates of both alkaloids behave towards nitric acid exactly like the free bases.

The following method was gradually devised for determining both alkaloids when present in mixture:

Gently heat the solution of the two alkaloids, which should be as neutral as possible, upon a steam-bath, and precipitate by picric acid. Picrate of brucine separates only very slowly in the cold. Under the influence of heat it becomes more flaky, and less prone to stop the pores of the filter. After a while collect the picrates upon a tared filter, wash with cold water until this runs off colorless, dry at 105° C., and weigh. Now transfer the precipitate as completely as possible from the filter into a beaker, pour nitric acid (sp. gr. 1.056) into the filter to destroy any adhering picrate of brucine, and at the same time to wash anything soluble into the beaker. The acid should have previously been warmed upon the steam-bath, and it should be used in several successive portions. The contents of the beaker are now digested upon the steam-bath for some time [the author does not state how long or at what temperature], then the liquid exactly neutralized, and mixed with a trace of acetic acid (picrate of strychnine is soluble in nitric acid as well as in alkalies, but insoluble in acetic acid if highly diluted). After it has become completely cold, the residuary picrate of strychnine is transferred to the filter already used [which should be previously washed with cold water], washed, dried, and weighed. The difference of the two weighings gives the brucine.

The author quotes the following table of results to show the reliability of the method:

	I.	II.	III.	IV.
Strychnine, weighed	0.084	0.0905	0.1310	0.065
" calculated	0.081	0.0878	0.1340	0.068
Brucine, weighed	0.031	0.1435	0.0845	0.046
" calculated	0.033	0.1510	0.0850	0.048

The brucine was always used and weighed in its anhydrous condition.—*After Arch. d. Pharm.*, 1889, 158.

Testing the Purity of Reagents.

(Continued from page 78.)

18. *Barii Carbonas purissimus*.

Test for calcium and strontium: Dissolve 5 Gm. in diluted hydrochloric acid, evaporate to dryness, extract with absolute alcohol, and evaporate the alcoholic solution. Not more than traces of a residue should remain, and when this is moistened with alcohol, and ignited, the flame should not show a red tint.

Test for alkalis: Dissolve 5 Gm. of the salt in diluted hydrochloric acid, which must result in a clear solution. Dilute this to 150 C.c., heat to boiling, precipitate completely with sulphuric acid, filter after twelve hours, and evaporate the filtrate to dryness in a platinum capsule. Not more than traces of a residue should remain.

Test for metals: A solution of the salt in dilute hydrochloric acid (1 : 20) is not affected by hydrosulphuric acid, or by ammonia and sulphide of ammonium.

Test for other barium salts: On adding to a solution (1 in 20) of the salt in diluted nitric acid some nitrate of silver, not more than a faint opalescence should occur. On dissolving 1 Gm. of the salt in dilute acetic acid, adding 1 drop of indigo solution and a few C.c. of concentrated sulphuric acid, the color should not be discharged.

19. *Barii Chloridum purissimum*.

Test for alkalis: Dissolve 5 Gm. of the salt in 150 C.c. of water, heat to boiling, precipitate the barium with sulphuric acid, filter after twelve hours, and evaporate the filtrate to dryness in a platinum capsule. Not more than traces of residue should remain.

Note.—If the residue is to be determined quantitatively, a larger amount of the salt is to be used, and at the same time a determination of the residue left by the water and acid (without barium) is made. The author states that 20 Gm. of the salt were found to yield 0.04 Gm. of residue, which gave a strong reaction for potassium.

Since the ordinary course of analysis often requires that alkalis must be looked for in the filtrate obtained after determining sulphuric acid, it is necessary to use a chloride of barium which is entirely free from alkali. The author states that he is at present engaged in producing such a salt.

Test for metals: The solution (1 : 20), when treated with ammonia and sulphide of ammonium, undergoes no alteration, nor is the solution (1 : 20), slightly acidulated with hydrochloric acid, affected by hydrosulphuric acid.

Note.—Commercial chloride of barium frequently contains heavy metals (lead).

Test for chlorate of potassium: The author, having met with this contamination, directs the following method of testing: Triturate 2 Gm. mix them in a test-tube with 10 C.c. of strong hydrochloric acid, and warm gently. Neither the crystals or powder, nor the solution should acquire a yellow tint.

20. *Barii Hydroxidum crist. purissimum*.

"Pure white crystals which are soluble in water, leaving but little carbonate of barium behind."

Note.—Sometimes yellowish crystals are sold as "puriss."

Test for chlorides: A solution (1 : 30) of the oxide in dilute nitric acid is not affected by nitrate of silver.

21. *Bismuthi Oxidum Hydratum purissimum*.

Test for arsenic: Boil 1 Gm. of the salt with 10 Gm. of sulphuric acid, until the nitric acid has been completely expelled. Then test the liquid in Marsh's apparatus. After half an hour's slow passage of gas no arsenical mirror should appear.

Test for lead: Shake $\frac{1}{2}$ Gm. of the salt with a few drops of nitric and 25 C.c. of dilute sulphuric acid. A clear solution must result.

22. *Calcii Chloridum crystallisatum*.

Test for foreign metals and sulphuric acid: The aqueous solution (1 : 5) is neutral, and is not affected either by sulphide of ammonium, or by addition of hydrochloric acid and sulphuretted hydrogen water. On adding to the solution (1 : 20) some chloride of barium and a few drops of hydrochloric acid, no change should become visible within several hours.

The salt should be completely soluble in 10 parts of absolute alcohol.

On boiling 2 Gm. with solution of soda, no vapor of ammonia (recognizable by moistened curcuma paper) should be given off. On adding lime water to the aqueous solution (1 : 50), no change should be produced even on longer standing, and addition of ammonia should produce no turbidity (absence of barium).

23. *Calcii Sulphas purus precipitatus*.

On gently heating 2 Gm. with 10 C.c. of hydrochloric acid and 100 C.c. of water, a clear solution should result, which is not altered by adding ammonia and sulphide of ammonium, and heating. On precipitating this solution with oxalate of ammonium and filtering, the filtrate, on being evaporated and ignited in a platinum capsule, leaves not more than very minute traces of residue.

24. *Cupri Oxidum purum ponderosum*.

Dense, heavy, deep-black, finely granular powder.

On heating 100 Gm. and passing air over it, no acid vapors should be given off. If 2 Gm. are dissolved in hydrochloric acid, and the solution diluted to 100 C.c., it should be almost clear. After precipitating with hydrosulphuric acid, the filtrate should leave not more than a slight residue (a little iron). A solution (1 in 50) of the oxide in hydrochloric acid should not be rendered turbid by chloride of barium or sulphuric acid. On heating 20 Gm. with 50 C.c. of water upon a water-bath, pouring off the water, and evaporating, no weighable residue should remain.

25. *Cupri Sulphas purissimus crystallisatus*.

On dissolving 2 Gm. of the salt in 20 C.c. of water, precipitating with hydrosulphuric acid, filtering, evaporating the filtrate and igniting, not more than traces of residue should remain.

Note.—From 20 Gm. of the salt, the author obtained 0.014 Gm., that is, about 0.07% of residue.

26. *Diphenylaminum purum*.

A solution of 0.1 Gm. in 20 C.c. of pure concentrated sulphuric acid should yield a colorless or only very faintly yellowish solution. The melting point of the crystals is 54°C.

27. *Ferri Sulphidum*.

Sulphide of iron always contains traces of arsenic. Hence various methods have been proposed for obtaining hydrosulphuric acid gas absolutely free from arsenic. Thus the following have been recommended as sources of the gas, in place of sulphide of iron: Sulphide of barium, sulphide of calcium; solutions of barium, calcium, or magnesium sulphhydrate; artificially prepared pure sulphide of iron, sulphide of zinc in pencils, etc., etc.

According to Von der Pfordten, all arsenic may be removed from the gas eliminated out of the ordinary sulphide of iron by passing the gas over heated sulphide of potassium.

28. *Ferri Sulphas purissimus*.

If an aqueous solution (1 in 25) of the salt is heated to boiling, oxidized with nitric acid, under addition of a little hydrochloric acid, then mixed with an excess of ammonia to precipitate the iron, the filtrate should give no reaction for zinc when tested with sulphide of ammonium, nor should another portion of it, when supersaturated with acetic acid and tested with ferrocyanide of potassium, yield a brownish-red precipitate (presence of copper.)

29. *Hydrargyri Chloridum Corrosivum purissimum*.

Aside from the usual tests of purity, given by the pharmacopœia, the complete solubility of the salt should be ascertained. Lenz has pointed out that the commercial sublimate, when dissolved, often leaves behind a considerable insoluble residue.

30. *Hydroxylaminæ Hydrochloras* (Hydroxylamine Muriate. NOH.HCl).

This salt, which is in clear, colorless crystals, should form a clear solution with absolute alcohol. The alcoholic solution, when treated with platinic chloride, yields no precipitate (difference from and absence of ammonium salts).

Note. The author states that he often found chloride of ammonium in the commercial salt.

31. *Iodum resublimatum purissimum*.

On heating 2 Gm., no residue should remain. In other respects the author refers to pharmacopœial tests.

When iodine is to be re-sublimed for analytical purposes, this is best done by mixing it with iodide of potassium, then cautiously subliming, and immediately filling the product into small vials, which must be well closed.

32. *Potassii Chloras purissimus*.

Aside from pharmacopœial tests, the author points out that lead has once been found in the salt by Hilger, and arsenic by R. Otto. Therefore, if the salt is to be used for destroying organic matter in toxicological investigations, the absence of these contaminations must be insured.

33. *Potassa*.

Three sorts of caustic potassa are used in analytical laboratories:

a. *The purest*, called "*Potassa purissima*" (on imported bottles labelled: "*Kalium hydricum purissimum*," or "*Kali hydricum e Kalio sulphurico et Baryta hydrica paratum*").

b. *Second quality*: "*Potassa pura*" (on imported bottles: "*Kalium hydricum purum*," or "*Kali hydricum alcohole depuratum*").

c. *Third quality*: "*Potassa depurata*" (on imported bottles: "*Kalium hydricum depuratum*").

The author has given the characteristics of each of these sorts in great detail. As there exists much confusion regarding the relative degree of purity claimed for or possessed by these products, we quote the author's text in full.

33. a. *Potassa Purissima*. White, crystalline pieces.

Solubility and absence of alumina: 10 Gm. should give a clear and colorless solution with 20 C.c. of water. On super-

* Abstract from Krauch, Dr. C., "Die Prüfung der chemischen Reagentien auf Reinheit." 8vo. Darmstadt, 1888.

saturating this solution with acetic acid, adding a slight excess of ammonia, diluting to 100 C.c., heating half an hour in a beaker on a water-bath until only a faint odor of ammonia is perceptible, and setting aside for several hours at the ordinary temperature, no flocculi or precipitate should make their appearance. Should the application of heat have completely expelled all free ammonia, a few drops of this should be added, before the liquid is set aside.

The author has found in what professed to be this quality of potassa, not only alumina, but also sulphuric acid and baryta.

On adding to portions of the faintly alkaline solution, obtained as above, oxalate of ammonium and sulphide of ammonium, no change should occur (abs. of calcium and heavy metals).

If 5 Gm. are dissolved in dilute hydrochloric acid, the solution evaporated, the residue dried for half an hour at 100° C. and dissolved in 250 C.c. of water, with a little hydrochloric acid, the resulting solution should be clear (abs. of silica).

An aqueous solution (1:20) acidulated with nitric acid is at most rendered only faintly opalescent by nitrate of silver (limit of chloride).

On dissolving 2 Gm. in 10 C.c. of water, supersaturating with dilute sulphuric acid, adding a drop of indigo solution diluted with twice its volume of water, and afterwards 10 C.c. of concentrated sulphuric acid, the blue tint should remain unchanged even on prolonged standing (abs. of nitric acid).

Another method to detect nitric acid is as follows: Dissolve 50 Gm. of the potassa in 200 C.c. of water in a flask of the capacity of about 500 C.c., and add 500 Gm. of powdered zinc free from arsenic, and some reduced iron. Connect the flask with a receiver containing about 10 C.c. of very dilute sulphuric acid (from 1 part of sulphuric acid diluted with 100 parts of water), allow to stand a few hours, and then distil with a small flame, so as to obtain about 15 C.c. of distillate in 45 minutes. Now render the liquid in the receiver slightly alkaline with purest potassa [previously ascertained to be free from nitric acid], and then add about 2 C.c. of Nessler's reagent, which must not produce more than a yellow tint or faint cloudiness, but no decided brownish-red precipitate, such as would render the liquid opaque when viewed in a layer of about 5 centimeters in depth.

Note.—The remarks made under Acidum Sulph. purissimum (see April number, page 72) on tests for nitric acid, apply here also. Only it should be noted that the indigo test is not as satisfactory in the case of caustic alkalies. For this reason, the author has devised another method, in which any nitric acid present is converted into ammonia. When executed as described above, it will easily detect as little as 1 Mg. (and even less) of absolute nitric acid in 25 Gm. of caustic potassa or soda. Samples prepared by the author on purpose from 25 Gm. of the pure alkali and 1 Mg. of nitric acid, yielded a fluid which developed immediately a strong brownish-red cloudiness and precipitate, rendering the liquid opaque. A yellow tint or faint cloudiness, on the other hand, must be permitted, since this is often obtained even in a blank experiment (without alkali) on merely boiling water with zinc and iron. Indeed, it is always advisable to make a blank test besides the real one upon the substance itself. [This advice of the author is quite appropriate. It should be applied also to the indigo test for nitric acid. Indeed, analysts usually make duplicate tests, one upon water known to be pure, and the other upon the particular water to be examined.]

Commercial caustic alkalies are often contaminated with more or less of nitrite or nitrate (up to several per cent). If the amount of acid is to be determined quantitatively, the same reduction method as above described is used, but alcohol is used in the flask, and a known quantity of volumetric sulphuric acid is put in the receiver. After the distillation is finished, the amount of unsaturated acid is ascertained by titration.

On dissolving 5 Gm. of the potassa in 25 Gm. of 90% alcohol, a clear and colorless solution should result (abs. of carbonic acid). This test would also reveal the presence of other impurities, such as chlorides, and coloring matters due to bad management in the manufacture.

If 5 Gm. are dissolved in water, the solution strongly supersaturated with nitric acid, and a nitric acid solution of molybdate of ammonium added, no precipitate should appear, after setting the mixture aside for two hours in a warm place (abs. of phosphoric acid).

33 b. *Potassa pura. Potassa Alcohol depurata.*

White, crystalline lumps or sticks.

10 Gm. should give a clear, colorless solution with 40 C.c. of water. On diluting this to 100 C.c., supersaturating with acetic acid, and adding an excess of ammonia, no flocculi of alumina should separate within 5 minutes, nor should oxalate or sulphide of ammonium cause any turbidity. Only after standing some time may a precipitate of alumina appear.

Nitric and Sulphuric Acids, as well as Chlorides, must be absent. Test the same as under No. 33 a.

On dissolving 5 Gm. in dilute hydrochloric acid, evaporating, drying the residue at 100° C., and re-dissolving in

150 C.c. of water, the resulting solution should not be more than slightly turbid (limit of silica).

If 2 Gm. of this potassa are dissolved in 10 C.c. of water, and the solution poured into a mixture of 8 C.c. of hydrochloric acid (sp. gr. 1.120) and 8 C.c. of water, no effervescence should occur (abs. of carbonate).

33 c. *Potassa depurata.*

White, crystalline lumps or sticks.

The aqueous solution should be clear and colorless.

Test for nitric acid: If 2 Gm. are dissolved in 10 C.c. of water, the solution supersaturated with sulphuric acid, then 1 drop of indigo solution diluted with twice its volume of water, and afterwards 10 C.c. of concentrated sulphuric acid added, the bluish color should not be discharged.

Absence of carbonate is determined as under 33 b.

Note.—This quality of potassa contains usually about 1% of chloride, also a little silicic acid and alumina. A solution of 5 Gm. in 100 C.c. of water, when supersaturated with hydrochloric acid, and afterwards with ammonia, at once separates flocculi of alumina.

(To be continued.)

Improved Method of Assaying Mercuric Chloride in Antiseptic Dressings.

PROF. BECKURTS publishes (in *Pharm. Centralhalle*) an improved method for determining the quantity of mercuric chloride in antiseptic dressings, based upon a process formerly recommended by him, but which was subsequently found not to be applicable in all cases, owing to the presence, in some dressings, of certain interfering substances. The new process is as follows:

Put 20 Gm. of the sublimated gauze (cut into strips) or of the sublimated cotton into a 1,000 C.c. flask, together with 0.5 Gm. of sodium chloride and 250 C.c. of warm water. Carefully drive out all air-bubbles, allow to cool, and then add enough distilled water to make 1 liter. Shake the mixture thoroughly [which is evidently intended to be done so that as little air can mix with the liquid as possible], and filter off 500 C.c., or more exactly 493 C.c., if the spec. grav. of the cotton fabric is taken into consideration, being assumed to be 1.400, and therefore displacing water in the proportion of 10 to 7. Mix the filtrate in a flask with 0.2 Gm. of ferrous sulphate, then with solution of soda to alkaline reaction, and lastly with diluted sulphuric acid to faintly acid reaction. Now add to the mixture, which has been rendered turbid by the separation of calomel, enough of a $\frac{1}{10}$ volumetric solution of iodine to make it contain a small excess of iodine. Immediately add a little gelatinized starch, and determine the excess of iodine by retitration with $\frac{1}{10}$ volumetric hyposulphite up to the point of discoloration. By multiplying the added cubic centimeters of the $\frac{1}{10}$ iodine solution, less the number of C.c. of hyposulphite, with 0.00271, a product will be obtained which represents the amount of mercuric chloride in 10 Gm. of the dressing.

The author's analytical proofs of the reliability of this method are very satisfactory.—After *Pharm. Centralh.*, No. 12.

The Preparation of Salicylate of Mercury.

THE following method for preparing salicylate of mercury (mercuric) has been devised by Dr. E. Pieszczyk, of Königsberg:

Dissolve 27 parts of corrosive sublimate in 540 parts of lukewarm water, allow to cool to about 15° C., filter the solution, and add the filtrate, slowly and under stirring, to a cold mixture of 81 parts of solution of soda (sp. gr. 1.160), and 200 parts of water [or, simply, a solution of 12 parts of pure caustic soda in 268 parts of water]. After the oxide has deposited, it is washed with cold water, first by decantation, and afterwards upon a filter, until the washings cease to give a reaction of chlorine. It is then, while still pulpy, transferred to a flask, and agitated with enough water to make a thin fluid mixture, to which 15 parts of salicylic acid are then added. The whole is well mixed, and the flask heated upon a boiling water-bath. After a very short time the contents of the flask, if constantly kept in motion by rotation, will acquire a white tint, owing to the change of the yellow oxide of mercury to white salicylate. It is important to keep the mixture in constant motion, so that no particles of mercuric oxide may be imbedded in lumps of salicylate.

When the salicylate has been completely formed, it is transferred to a filter and washed with warm water to remove the excess of salicylic acid. Washing is interrupted when the water ceases to have an acid reaction.

When dried at a moderate heat the compound appears as a white, amorphous powder, which when diffused through water containing a few drops of soda solution [the author does not give any relative proportions between the quantity of the salt and soda] forms a perfectly clear solution. Hydrochloric acid produces in the latter a gelatinous precipitate.

The author obtained from the salt, on analysis, 59.16 per cent of mercury. This shows the salt to have a basic character, and to have the composition $\text{HgC}_2\text{H}_3\text{O}_2$.

Density: Specific Gravity.

THE following is a portion of a paper read by H. Droop Richmond at a recent meeting of the Society of Public Analysts on "Density" [we have extended the title], and published in *The Analyst* (April, 1889):

When we talk of the density of a body, we mean the mass of a unit of volume of that body, or, as the unit of mass has been fixed at 1 Gm. and the unit of volume at 1 cubic centimeter, the number of Gm. in 1 cubic centimeter; thence it follows that density is not a relative but an absolute property. Notwithstanding that the cubic centimeter has been fixed as the volume of 1 Gm. of water at 4° C. (the point of maximum density), a custom has sprung up of assuming that an instrument for taking density graduated to hold x Gm. of water at 15° C., 15.5°, or 16° C. (as the case may be), holds x cubic centimeters; this arbitrary creation of units of volume, besides being clearly wrong, is liable to create confusion, and renders the expression of results uncertain, which uncertainty is not removed entirely by the use of such an illogical expression as "the density at 15° compared with water at the same temperature." To compare an absolute quantity is absurd; this uncertainty is much less, however, than that caused by errors of observation, many of which are not even noticed, much less corrected.

I do not propose to discuss the taking of densities of either gases or solids, on account of the special methods and precautions against errors, which are so well known in the case of gases, and of the comparative unimportance attaching to the determination of the densities of solids; my remarks must therefore be taken as applying to liquids only.

We use practically three methods for determining the densities of liquids: 1. By hydrometers. 2. By the measurement of the loss of weight of a solid in a liquid—*e. g.*, the Westphal balance and the torsion balance. 3. By the determination of the mass of known volume—*e. g.*, the pycnometer.

1. *Hydrometers.*—The faults of these instruments consist in errors introduced by the cohesion of the liquid to the material of which the instrument is made, which renders it difficult to read off the exact point which is at the level of the surface of the liquid; as also the volume of the portion immersed is determined in part by the cohesion, it follows that hydrometers do not give the same reading in different liquids, whose density may be the same, if the viscosity is different. Another error is caused by expansion by heat, if the hydrometer is used at a different temperature than that for which it was graduated. Their merit consists in speed, and if they are graduated for use in one particular liquid and at a pretty constant temperature, fairly exact results are obtainable (within 0.0005).

2. *Instruments which measure loss of weight in a liquid.*—Of these the Westphal balance is the most important and widely used, and is extremely quick and convenient, where great accuracy is not required, though open to grave errors. Its faults are the errors due to cohesion (very slight); to the difference between true weight and apparent weight in air; to the condensed film of air on the plummet, which is, however, removed on immersion in most liquids; to the unequal expansion of plummet and liquid of which the density is to be taken at any other temperature than that for which the instrument is set, and of the arms of the balance; to the wire or thread used to suspend the plummet (usually reduced to a minimum by the use of a very fine thread); and to the imperfections in the balance (often large in those commonly in use). Many of these errors may be neglected in ordinary work; for instance, those due to cohesion, unless the fluid is very viscous; to difference between true weight and apparent weight in air, if the substance has a density near 1; to the condensed film of air; to the use of a wire or thread; and to the expansion of the arms. It is in the construction that the Westphal balance chiefly errs, one error having been pointed out by Allen (*Analyst*, 1889, p. 11) in the length of the intervals between the divisions. The beam of the Westphal balance is usually made 10 centimeters in length, so that to insure absolute accuracy the intervals should be 1 centimeter apart, within $\frac{1}{16}$ of a millimeter, an amount of accuracy which it is not easy to attain in practice, and which may easily be diminished by wear. Another error is introduced in the hook riding on a knife edge, from which the plummet hangs; if the position of this is changed, as it must necessarily often be, a difference in the reading may be observed, amounting sometimes to .001. Another error may occur from one of the riders not sitting absolutely exactly in its place, but inclined to one end of the beam or the other; this error may amount to as much as .0005. The error introduced by the expansion of the plummet is, of course, obvious, and should be allowed for by noticing the difference between the actual density of water at various temperatures and the indicated density. Unless this is done, determinations made at higher temperatures are only relative, and cannot even be compared with those obtained by another instrument, unless the coefficient of expansion of the material of which the two plummets are made is the same. An inconvenience is felt if the density of a liquid is to be taken at a temperature differing from the temperature at which it is, a comparatively large bulk of liquid having to

be warmed or cooled, as the case may be. I should fix the limit of accuracy of the Westphal balance at not much less than .0005, although closer duplicate readings are often obtained.

The torsion balance is open to all the faults of the Westphal balance, except those due to construction, and, besides, has the tendency to acquire a slight permanent set, and is not to be recommended except for rough density determinations.

3. *Instruments in which the mass of known value is taken, or pycnometers.*—These are practically two in number, the specific-gravity bottle and the Sprengel tube and its modifications, neither of which presents any real advantage over the other. It is perhaps rather easier to adjust the temperature of the liquid in the Sprengel tube, but, on the other hand, the Sprengel tube is more liable to lose weight than the bottle, when in constant use. The errors, all of which can be readily allowed for, are the following: those introduced by the condensed film of air, both inside and outside; by the difference between true weight and apparent weight in air; and by the expansion of the glass or other material of which the instrument is made. The most difficult to allow for is the condensed film of air, which I consequently try to eliminate as far as possible by the following plan: dry the bottle or tube by heating it and passing a current of dry air through it (of course, removing the thermometer if the temperature is higher than the highest it will bear), cool by pouring a current of cold water on the outside, wipe dry, and weigh at once; duplicate weighings very rarely differ by as much as .0005 Gm. I then fill with distilled water freshly boiled in a platinum vessel, adjust the temperature accurately to 4° C., wipe dry, and weigh at once. The increase of weight in Gm., corrected for the volume of displaced air, will give the number of cubic centimeters the bottle or tube will hold. The difference between duplicate weighings should not exceed .0005 Gm.; the difference between the capacity at 4° and the weight (corrected) of water in Gm. held by the bottle or tube held at any other temperature, divided by the density of water at that temperature, will give the increase of capacity due to expansion of the glass or other material of which the bottle or tube is made. A table of capacities at various temperatures, and a formula for the expansion, may easily be made of it for each instrument.

TABLE OF DENSITIES OF WATER.

(Compiled from the results of Pierre, Despretz, and Kopp.)

Temp. C.	Density.	Temp. C.	Density.
0°.....	.99988	40°.....	.99237
4°.....	1.00000	50°.....	.98917
10°.....	.99975	60°.....	.98348
15.5° (60° F.).....	.99910	70°.....	.97794
20°.....	.99826	80°.....	.97193
30°.....	.99575	90°.....	.96561
37.8° (100° F.).....	.99318	100°.....	.95365

The determination of densities at higher temperatures than 15.5° is usually only required for bodies that are solid at that temperature, such as butter and other fats; Muter proposed to do this at 100° F. (37.8° C.), and graduated his instruments with water at the same temperature, and gave to these determinations the name of "actual density," an unfortunate name, as they were really the actual densities divided by the density of water at that temperature. These, however, were good determinations, as there could be no mistake as to what they really were. Three years ago Estcourt proposed to take the density of fats at 100° C. by the Westphal balance, a plan which has become rather general among English analysts, but is a distinct falling off from Muter's method, because the expansion, which is not usually allowed for, is enormously increased at that temperature; and, moreover, the temperature is exceedingly difficult to obtain, as the boiling point of water depends on the pressure of the air. I do not consider that the results obtained by two analysts taking their densities thus are comparable within 0.002; the only advantage which this method has over the other is, that beeswax and carnauba-wax are liquid at 100° C. while solid at 100° F. In the regulations for analysis for the State of Colorado, it is laid down that the densities of fats shall be taken at 40° C., which seems to me the most convenient temperature, now that the centigrade scale is in general use, and I think that we may expect, if the precautions I have drawn attention to are taken, that two analysts should not differ by more than 0.0002 or 0.0003.

There are two minor precautions I should wish to draw the attention of analysts to: first, to allow a sufficient time (when using the bottle or tube) for the liquid to contract to its full amount; alcohol contracts very quickly, glycerin very much more slowly, while, as an extreme case, Perkin has recorded a mixture of aldehyde and water $C_6H_5O + H_2O$ which took several hours (*J. Chem. Soc.*, 1887, p. 817); the other precaution is to use an accurate thermometer, the great majority of low-priced thermometers being sensibly wrong.

In conclusion, I would recommend that all densities should be the weight (mass) of the substance in the cubic centimeter, that the density of liquids should be taken at 15° C., and of fats at 40°. A symbol, such as D_{15} , meaning density at 15°, and D_{40} , at 40°, might be advantageously adopted.

The Pharmacopœial Tests of Iodide of Potassium.

THE Pharmacopœia Committee of the German Pharmaceutical Association proposes several modifications in the official characterization of this salt, which will render the tests, on the one hand, more rigorous and exact, and, on the other hand, within the limits of the manufacturer's possibilities. We first give the proposed pharmacopœial text, in which the alterations of the text of Pharm. Germ. II. are inclosed in quotation marks, and afterwards the commentary.

Kalium Jodatum.

White, cubical crystals, not absorbing moisture when exposed to air, having a sharply saline and afterwards bitter taste, soluble in 0.75 parts of water and in 12 parts of alcohol. The aqueous solution, mixed with a little chlorine water, and shaken with chloroform, colors the latter violet. When mixed with tartaric acid, it yields, upon standing for a short time, a white, crystalline precipitate.

When heated in a loop of platinum wire, the salt should impart to the flame a tint which is violet from the beginning. When laid upon moistened red litmus paper, it should not at once color the latter violet-blue.

"A freshly prepared solution of the salt with 20 parts of previously boiled water, when mixed with solution of starch and diluted sulphuric acid, should not at once assume a blue color." If a brisk evolution of gas is produced by means of zinc and "diluted" hydrochloric acid [contained in a flask], and a solution of the salt mixed with gelatinized starch is added, it should not acquire a blue tint; "and the generated gas shall not impart a brown or black color to paper moistened with solution of acetate of lead."

The aqueous solution of the salt (1 in 20) should "not at once" be altered. When treated with a granule of ferrous sulphate, a drop of solution of ferric chloride, and some solution of soda, with gentle heating, the solution should not acquire a blue color on being supersaturated with hydrochloric acid.

Solution of hydrosulphuric acid should not alter the aqueous solution (1 in 20) [of the salt].

On dissolving 0.2 Gm. of iodide of potassium in 2 C.c. of water of ammonia, and precipitating, under agitation, with 13 C.c. of one-tenth normal solution of nitrate of silver, the filtrate, when supersaturated with nitric acid, should not be rendered completely non-transparent within ten minutes, "nor should it acquire a dark color."

To be carefully preserved.

Commentary.—The methods of applying the test have been modified in several directions. On the other hand, it appeared to be superfluous, in the ignition test, to direct that the salt should be used in a powdered condition, since this is the usual way. It was also deemed unnecessary to state that, for all tests, several crystals of different sizes should be reduced, together, to a coarse powder. For the same reason, it was omitted to direct "broken crystals" of the salt in the test with moistened litmus paper, since the salt may also be used in a powdered condition. To test the salt for the presence of carbonates by means of phenolphthalein was not deemed advisable, as the test is too rigorous.

In the test for iodate several precautions have to be observed. According to the investigations of Mühe and Beckurts (1887), the carbonic acid contained in water which has been exposed to air, exercises a decomposing action upon the solutions of alkali iodides, setting iodine free. Hence a solution of iodide of potassium prepared with water containing air and carbonic acid, when mixed with gelatinized starch and dilute sulphuric acid, usually turns bluish after a short time without the tint being due to iodic acid. But if the solution is prepared with previously boiled water, and if the starch and acid are then immediately added, no blue tint is produced, if the salt was pure. The tint is developed gradually, by exposing the mixture to air, in consequence of the absorption of oxygen from the latter. It is, of course, of importance to test the solution immediately after having been made with air-free water, otherwise the advantage gained by the use of the latter would be lost.

It is unadvisable to combine the test for iodate with the subsequent one for nitrate, since the evolution of gas would generally be too feeble. It is much preferable to generate hydrogen, in a separate test-tube, by means of a piece of zinc and dilute sulphuric acid, and then to add the solution of the salt mixed with gelatinized starch, or else the previously prepared acid solution (provided the blue color failed to appear). It is particularly to be observed that *diluted* hydrochloric acid (Ph. Germ. II., sp. gr. 1061) be used, since the strong acid produces a blue color, even in the case of the purest iodide of potassium.

The hydrogen gas developed by the last-named reaction is to be tested by means of acetate of lead paper. If this

acquires, after a short time, a brownish to black tint, this shows the presence of hydrosulphuric acid, caused by the contamination of the iodide with some sulphite or hyposulphite. These impurities which are [sometimes] added to cover the presence of iodate, will betray their presence by the above test, even if only very minute in quantity. Hyposulphites are also discovered by the last test given in the above description of the salt, namely, that with nitrate of silver (for presence of chlorine). The final filtrate, separated from the chloride of silver, when acidulated, will become black—if a hyposulphite had been present—due to the separation of sulphide of silver. Sulphites, however, are not detected by this test.

Pharm. Germ. II. directs the salt to be tested for sulphate by mixing 20 C.c. of the solution (1 in 20) with 10 drops of solution of nitrate of barium, whereby no turbidity should be produced within five minutes. Almost the same object is attained by directing that turbidity should not be produced "at once." The latter direction saves time, and does not introduce rigid conditions of time, exact measures, etc.

NOTE BY ED. AM. DRUGG.—As we are perfectly familiar with the language and phraseology of the German Pharmacopœia, we can scarcely be accused of speaking from misunderstanding when we assert that the construction and wording of the *text* of this work leave much to be desired. We refer to the uniformity of treatment and to the syntax. There is evidently a desire to construct the text in a flowing, sometimes almost rhetoric style, with an evident effort to avoid monotonous similarity in the construction of passages. There is no fixed uniformity in the method of enumerating the physical properties of substances, such as color, shape, solubility, etc., and also in other matters, the arrangement being sometimes altered, apparently only for the purpose of rendering the sentences smoother. This is not the proper place to expatiate on this subject. But in our opinion it would be very desirable if the very excellent contents of the text of this Pharmacopœia, both present and prospective, were clothed in language free from any ambiguity, and chosen with a view to uniform treatment, irrespective of beauty or smoothness of diction, or pleasant cadences of sentences. We do not look for this in a law book, such as a pharmacopœia. If we can have it, *in addition* to logical and uniform treatment of each subject, we will thankfully accept it. But rather sacrifice the style than the uniformity and thorough perspicuity.

The Assay of Ipecac.

Messrs. R. A. CRIPPS and A. WHITBY have made a study of the methods so far proposed for assaying the emetine in ipecac, and they have arrived at the following results:

1. That of the methods yet proposed, the process of Lyons with ammoniated ether is to be recommended as most fully exhausting the drug, at the same time being rapid in execution. We, however, prefer to conduct the extraction by cold percolation, thereby avoiding so many weighings, the exhaustion being fully as complete.

2. That the ammoniated chloroform of Flückiger is decidedly objectionable.

3. The use of acetic ether alone, acetic ether with one per cent of glacial acetic acid, or acetic ether, chloroform and glacial acetic acid, is attended with good results; the extraction is, perhaps, rather more rapid than by Lyons' solvent, and the process works well. It is carried out thus:

Improved Process.—2.5 grammes of ipecacuanha root, in fine powder, are introduced into a small glass cylindrical percolator, about 200 Mm. long, and 11 to 12 Mm. internal diameter, very lightly shaken down, and a loose plug of cotton-wool placed on the surface of the powders; 10 C.c. of the solvent are now poured on and allowed to soak through the powder, care being taken to observe if any air spaces or channels exist in any portion. When the fluid begins to drop from the percolator, the upper open end is securely corked to prevent any further flow of the liquid, and the whole allowed to macerate for about two hours, or preferably over night. Percolation is then proceeded with until about 50 C.c. of percolate are obtained, or the root is exhausted; this is the case if six to ten drops of the liquid, when evaporated, and the residue, dissolved in dilute sulphuric acid, give no precipitate with Mayer's solution.

The solution thus obtained is introduced into a separator, and washed with *four* successive quantities of slightly acidulated water (about 8 C.c. at a time). The aqueous liquid now containing the emetine is washed once more with ether while still acid, then rendered alkaline with ammonia, and washed *three* times with 6 C.c. of chloroform. The mixed ethereal and chloroformic solutions are washed once with water, then evaporated in a current of air, and dried by exposure over sulphuric acid for some hours. The residue is then weighed, dissolved in 20 C.c. of water acidulated with six drops of 5% (by volume) sulphuric acid, in which it should be almost entirely soluble, and titrated with Mayer's solution (half strength) in the usual manner; 1 C.c. = 0.00945 Gm. emetine.

This is the method we recommend when strictly accurate results are required, but for general use it is frequently of importance to save time, even at a slight loss of accu-

racy. This saving of time may be effected either by drying the final residue on a water-bath for one hour only, when the amount of alkaloid found by titration will be slightly below the correct percentage, or by dissolving the emetine obtained, without previous drying, in dilute acid, and titrating; or, finally, by shaking out the alkaloids from the original acetic ether solution by acid water, using, however, four washings of only 5 C.c. each (to make the final bulk only 20 C.c.) with six drops of 5% sulphuric acid in the whole, warming the solution gently to remove dissolved acetic ether, and titrating with Mayer's solution. These alternatives have the disadvantage of not allowing two results in the same estimation, which serve as a check upon each other.

The experiments recorded above were all performed upon the same sample of root; since these were completed, further experience of the use of acetic ether by cold percolation has served to increase our confidence in that solvent, the results being always very close to those by Lyons' method; it is of great importance that the dimensions of the percolator should be such as described, if the same quantity of powder be operated upon.

Since the adoption of the acetic ether as a solvent, the average percentage of emetine found in ipecacuanha has been considerably higher than when we employed ammoniated chloroform, as shown by the following record from the laboratory journals:

By ammoniated chloroform impure alkaloid weighed 1.60, 1.57, 1.85, 1.52, 2.05, 1.82, 1.94, 2.65, 2.56, 2.90, 2.09; average of 12 samples, 2.00 per cent.

By alkaloid by titration, 1.16, 0.94, 1.17, 0.94, 0.89, 1.20, 0.93, 1.23, 1.46, 1.51, 1.75, 1.34; average of 12 samples, 1.21 per cent.

By acetic ether, alkaloid by titration, 2.6, 2.5, 2.7, 1.9, 1.63, 1.85, 1.7, 1.13, 2.18, 1.85, 1.76, 1.80; average of 12 samples, 1.97 per cent.

Lastly, it has been stated by Flückiger and others that the woody portion of ipecacuanha root is practically inert. In order to prove the accuracy or otherwise of this statement, we estimated the amount of emetine in the woody column from which the cortical portion had been separated; the whole root assayed 2.40 per cent by Lyons' method; the wood alone, which amounted to about 15 per cent of the total weight of the root, 0.8 per cent; that is, about 5 per cent of the total emetine present in this example existed in the woody column.—After *Pharm. Journ.*, March 9th.

Method of Estimating Tartaric Acid.

H. HEIDENHAIN, of Brooklyn, has made a study of the so-called Goldenberg's method of estimating tartaric acid. This method is one of the most commonly used, and has been held to give very satisfactory results. It is, however, affected by certain defects, which Heidenhain endeavored to eliminate.

Without entering into the details of the preliminary investigations, the following facts represent the main results, and these facts are practically utilized in the improved method which will be given below:

1. Acetate of potassium exercises a decomposing influence upon bitartrate of potassium.
2. This influence can be counteracted by the addition of much free acetic acid, a good proportion being 2 parts of free acetic acid for every 1 part in combination with potassium.
3. In presence of acetate of potassium and excess of acetic acid, the addition of alcohol causes a very complete separation of the bitartrate. The proper proportion of alcohol is 10 parts of alcohol of 95% for 1 part of the aqueous solution.

Improved Method.

[In the text here given, 1.88 Gm. of bitartrate are directed to be taken. It makes, of course, no difference whether the salt is pure or not, because whatever tartaric acid is contained in it will finally come out as a bitartrate. According to the author, the loss is only 0.2 to 0.1 per cent of the full amount of bitartrate that can possibly be obtained.]

Make a solution of 1.88 Gm. of the bitartrate, and 1.25 Gm. of carbonate of potassium, in a tared porcelain capsule. Bring it to a volume of 50 C.c., add 1.5 C.c. of glacial acetic acid, mix carefully, and evaporate until the contents amount to 10 Gm. Redissolve any dry crust on the sides of the capsule in the liquid contents, add 3 C.c. of glacial acetic acid, stir well, and allow to cool. Now add 100 C.c. of alcohol of 90%, stir thoroughly for a few minutes, allow to stand half an hour, filter, and wash once by decantation with alcohol, taking care that as little of the precipitate as possible be transferred to the filter. Cover the funnel, after the liquid has drained off, and close its outlet [to prevent the paper from becoming entirely dry while re-working the precipitate in the capsule].

Now dissolve the precipitate with hot water, add 1.5 C.c. of glacial acetic acid, again evaporate, preventing the formation of a permanent crust, to 10 Gm., and remove from the water-bath. Add 1.5 C.c. more of glacial acetic acid, mix thoroughly, and allow to cool. Then add 100 C.c. of alcohol of 95%, also 0.5 C.c. of a solution containing 200 C.c. of acetate of potassium, and 250 C.c. of glacial

acetic acid in one liter, stir well during five minutes, allow to stand half an hour, filter through the same filter as before, wash with alcohol until the filtrate runs off entirely neutral, and then titrate with $\frac{1}{10}$ normal volumetric solution of potassa.

The author appends some practical hints, from which we select the following:

Since bitartrate of potassium is notably soluble in weaker alcohol, it is necessary to prevent the evaporation of the alcohol from the filter as much as possible. It is therefore advisable, after decanting the liquid, to at once cover the precipitate with alcohol, and to keep funnel and capsule as well covered as possible. Nevertheless, when paper filters are used, it is scarcely possible to prevent the filtrate from gradually becoming clouded through traces of bitartrate. When a Gooch's filter is used (platinum crucible with minute holes in the bottom, and asbestos filter), no cloudiness is noticed.

The washing (with alcohol) must be continued until the filtrate is perfectly neutral. When paper filters are used, the reaction of the filtrate must be tested while the funnel is perfectly full. Otherwise, errors may creep in, for it is possible that a neutral filtrate may be obtained while the filter and funnel is only half full of liquid, while the unsubmerged part of the filter may still retain traces of acid.—After *Zeitsch. f. anal. Chem.*, 1888, 704.

Testing Ether and Chloroform.

PROF. L. L. DE KONINCK, of Liège, states that even "pure commercial ether" always contains certain impurities, particularly organic sulphur compounds, which remain behind as bad smelling residue when the ether is allowed to evaporate spontaneously. Such an ether is truly called "sulphuric ether," as it contains free sulphur in solution.

The presence of the latter is quickly and surely detected by shaking a portion of the ether, in a test-tube, with a drop of pure, brilliantly lustrous mercury. If but very little sulphur is present, the surface of the mercury assumes merely a dull gray tint. If more is present, the whole liquid assumes a grayish or blackish tint from the diffusion of sulphide of mercury.

Prof. Koninck thinks that this test should be added to those now prescribed by the pharmacopœias.

Pure chloroform, in the cold, does not reduce an alkaline solution of permanganate of potassium, but it does so in presence of alcohol. Since both potassa and soda generally contain organic impurities, these alkalies cannot well be used for the test. It is therefore preferable to dissolve the permanganate in saturated solution of baryta. In this case, not a trace of reduction will be noticed. On adding this solution to chloroform containing even a trace of alcohol, it will at once turn green from the formation of potassium manganate.—After *Zeitsch. f. ang. Chem.*

[While the last-named test for alcohol in chloroform is useless for the pharmacopœial chloroform, which is purposely directed to contain a small percentage thereof, the test will probably be very serviceable for the detection of alcohol in essential oils.—Ed. AM. DR.]

Estimation of iron in Water.

J. CARTER BELL communicates the following paper to the *Journ. of the Soc. of Chem. Industry* (March 30th):

In a water case in which I was engaged some months since, this question was asked in court: How much iron may a river water contain and yet be fit for bleaching purposes? An eminent water analyst was in the witness-box; he made reply, from 0.1 to 0.2 of a grain to the gallon. This gentleman could have had no experience in bleaching, or he could not have given such an absurd statement. I think I may safely assert that no river water in the kingdom contains so large a quantity of iron: as 0.1 of a grain to the gallon, of course chalybeate springs excepted, and even if these were to run into a river the iron would soon be deposited. The case in which I was engaged was where a firm of bleachers brought an action against a firm of dyers who were six miles up the river. The complaint was that waste dye waters containing iron were thrown into the river, and this polluted water found its way into the complainant's reservoir. At that time I obtained many samples of water from various points of the six-mile course, and I analyzed several hundred samples of water for iron, and in no one case when the sample was taken about a mile from the offending works could I find an amount of iron equal to 0.1 of a grain to the gallon, and I need not say that the quantity found at the point named would be infinitesimally small by the time it arrived at the complainant's works. The judge seemed greatly impressed with one of the complainant's experts, who gravely informed his lordship that when the iron was once put into the water, the iron, being indestructible, must of necessity come down to the complainant's works and do the damage which was alleged. It would have been fairer on the part of this witness if he had said that the iron in the water at complainant's works was no more than is found in the Thames, Severn, or any other great river in England, which may vary from one part in five millions to one part in seven or ten millions.

The process I adopted for the estimation of the iron was

a very considerable modification of Dr. Carnelley's method, of which he read an account before the Manchester Literary and Philosophical Society in 1874. This colorimetric method is not new, for a paper was published in 1871 by H. Rheineck in *Dingler's Polytechnisches Journal*, on the estimation of iron in liquids used in dye works.

Seventy C.c. of the water were evaporated to dryness in a platinum dish, the residue gently ignited to burn off organic matter. One C.c. of pure nitric acid was then added, and allowed to flow over all the residue. The nitric acid was evaporated off on the water-bath. The residue was again moistened, this time with 1 C.c. of a 10-per-cent solution of hydrochloric acid, about 5 or 10 C.c. of distilled water added, warmed on a water-bath, and the solution filtered into a 50 C.c. Nessler tube. The filtrate was made up to 50 C.c. This 50 C.c. must be poured into another 50 C.c. tube containing 1 C.c. of freshly made ferrocyanide solution. To this mixture 1 C.c. dilute nitric acid was added; this is then compared with a tube containing a known weight of iron.

Standard solution of iron: 1 C.c.=0.001 of iron.

This is made by taking the purest and finest iron wire, dissolving in nitrohydrochloric acid, evaporating to dryness, taking up with a slightly acid solution of hydrochloric acid. I consider this preferable, as it is more stable than the sulphate of iron and ammonium.

Standard ferrocyanide: 1 part of salt in 25 parts of water.

Standard nitric acid: 50 C.c. of strong acid made up to one liter.

Standard hydrochloric: 100 C.c. of strong acid made up to one liter.

It is absolutely necessary that a blank experiment be made with pure distilled water; if a slight blue color is obtained, a correction can then be made in estimating the iron in the sample of water.

New Method of Examining Alcohol for Aldehyde.

THE previous methods of testing commercial alcohols for small quantities of aldehyde and amyl alcohol are only qualitative, and they also fail in distinguishing between these two impurities. C. Girard and X. Rocques have succeeded in overcoming these defects by the following method: 3 Gm. of the hydrochloride of metaphenylenediamine are dissolved in 200 C.c. of alcohol of 50%, and the solution boiled for half an hour with an inverted condenser; the liquid acquires a yellow color. After cooling for half an hour the solution is shaken; if aldehyde be present, the color gradually deepens and acquires a fine green fluorescence, due to the action of the air. The liquid is then rapidly distilled until 125 C.c. have passed over, when the distillate will be of 75% strength. The distillate is examined for amyl alcohol by Savalle's method, which consists in heating to 66° C. with an equal volume of sulphuric acid, producing a brown coloration, the depth of which can be compared with that given by known percentages of pure amyl alcohol in alcohol of 75%. The aldehyde compound remains almost entirely in the residue of the distillation, whilst the amyl alcohol passes over completely with the 125 C.c. The quantity of aldehyde is estimated by the depth of coloration of the residual liquid.

—*Compt. Rend. and J. Soc. Chem. Ind.*

Note by Ed. Am. Drugg.—Metaphenylenediamine is an artificially obtained organic base, derived from the phenol nucleus (C_6H_5), by substitution of 2 molecules of amidogen (NH_2) for 2 atoms of hydrogen. Its formula, therefore, is $C_6H_4(NH_2)_2$. It is a solid, has strong basic properties, and forms salts with acids.

Boric Acid a Natural Constituent of Wine.

GEORGE BAUMERT makes the surprising announcement (*Ber. d. D. Chem. Ges.*, 1888, 3290) that, according to his investigations of German as well as Californian wines, must, and portions of the vines themselves, boric acid is a natural constituent of wine. This had previously been announced already by Soltzen and Ripper. According to Baumert, there is no difficulty in detecting the boric acid with turmeric paper in the ash.

Note by Ed. Am. Dr.—If this statement is correct, the analyses of the soils of many vineyards, in which chemists did not find any boric acid, will have to be repeated. It is hardly probable that boric acid is a necessary or unavoidable constituent of wine, though it may be a frequent and accidental one.

A New Reaction for Uric Acid.

To a very small quantity of uric acid, in a porcelain evaporating dish, are added two drops of water and one or two drops of nitric acid or bromine water. This is slowly evaporated so that the residue has a yellow and not a brick-red color. The residue is then dissolved in two or three cubic centimeters of concentrated sulphuric acid, and mixed with a few drops of commercial benzene, which gives a blue color, but changes to a brown as soon as the benzene evaporates. On further addition of benzene the blue color reappears. This coloration is due to the action of thiophene on alloxan and its derivatives obtained by the oxidation of uric acid. Chemically pure benzene gives no coloration.—*DENIGES in Chem. Zeit. and J. Anal. Chem.*

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FREDERICK A. CASTLE, M.D. EDITOR.

CHARLES RICE, Ph.D. ASSOCIATE EDITOR.

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THE AMERICAN DRUGGIST is issued in the latter part of each month, dated for the month ahead. Changes of advertisements should reach us before the 10th. New advertisements can occasionally be inserted after the 18th.

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EDITORIAL.

THE present Acting Secretary of the Treasury has recently rendered a decision regarding the release of alcohol from duty which will, no doubt, be hailed with satisfaction by all charitable institutions, provided they can manage to avail themselves of it. We know that applications have in former years been made to the Secretary of the Treasury for the purpose of having the duty on alcohol used in public hospitals remitted, but the decision has always been adversely, because the law did not appear to be broad enough to cover this. The section of the Revised Statutes of the U. S. relating to this subject reads as follows: "The Secretary of the Treasury may grant permits to any incorporated or chartered scientific institution or college of learning to withdraw alcohol in specified quantities from bond without payment of the internal revenue tax on the same, or on the spirits from which the alcohol has been distilled, for the sole purpose of preserving specimens of anatomy, physiology, or natural history belonging to such institution, or for use in its chemical laboratory. Also to any scientific university or college of learning created and constituted such by any State or Territory under its laws, though not incorporated or chartered." This section has now been interpreted by the Acting Secretary of the Treasury to cover also the following uses of alcohol in hospitals: 1. In the manufacture, in the laboratory, of tinctures, liniments, and other pharmaceutical preparations for use in the hospital wards and in the out-patient department. 2. As a lotion for bathing the afflicted parts of the patients under treatment in the hospital and out-patient department. 3. As an antiseptic wash by the surgeons before and after operations in both departments. 4. As an antiseptic solution for cleansing surgical instruments. 5. As an antiseptic solution for preparing and preserving catgut ligatures to be used in surgical operations. 6. For burning in spirit lamps, principally in the analysis of urine. It is distinctly provided, however, that the alcohol and the preparations mentioned shall be used only in the manner prescribed, and shall never be sold to any person inside or outside the hospital.

There are, however, various other purposes, equally legitimate, for which alcohol is required, and which should not be excepted, such, for instance, as the preparation of certain medicated gauzes (Bruns' carbolyzed gauze, etc., etc.). And besides, the stipulation that no preparation containing or made with free alcohol shall be sold will probably render it impossible to obtain free alcohol, for any institution which charges board for in-door patients or demands a fee from out-door patients.

Correction.—In reporting the list of Officers of the College of Pharmacy of the City of New York elected at the recent annual meeting, one of the names has accidentally been omitted. Among the trustees elected, to serve for three years, should have been the name of Mr. Henry Schmid.

The Paris International Exposition.

The following countries or sections will be officially represented: In Europe: Greece, Norway, Servia, Switzerland, San Marino, and Monaco; in Asia: Japan, Persia, and Siam; in Africa: Morocco, and the South African Republics; in Oceania: Victoria, New Zealand, and New South Wales; and in America, the United States, the Argentine Republic, Bolivia, Chili, Colombia, Ecuador, Guatemala, Hayti, Mexico, Nicaragua, Paraguay, San Domingo, San Salvador, Uruguay, and Venezuela. Besides, private committees represent all the other States of Europe except Germany, and also Egypt and Brazil. Some British colonies also, not enumerated separately, will be represented. Great Britain has obtained the enormous space of 25,000 square meters, all told, by far the largest aggregate. Its exhibitors are at work in dead earnest, and a fine display is expected. The United States has 8,000 meters, and will be extremely well represented in the machinery gallery.—*Am. Tech. J.*

An Act Relating to the Practice of Pharmacy.

The following Senate Bill No. 319 was introduced into the Senate of this State February 8th, 1889, by Mr. Laughlin, referred to the Committee on Public Health, reported favorably, was voted affirmatively, and sent to the governor for approval:

Section 1. To entitle any person to a license as a pharmacist or assistant pharmacist from any board of pharmacy created under the laws of this State, he must prove to the board of pharmacy to which application is made, in addition to the present requirements of the law relating to the granting of licenses by such boards: That he is a resident of the city, county, or district for which the board of pharmacy to which application is made is created, or, if a non-resident, that he intends to practise in said city, county, or district; that he has not applied for a license to, or been examined by, any other board of pharmacy of this State and been refused such license within six months immediately preceding, which proof may be made by his own affidavit.

§ 2. All acts and parts of acts inconsistent with this act are hereby repealed.

Louisiana State Pharmaceutical Association.—The annual meeting of this Association was held at New Orleans on April 10th to 12th, President C. L. Keppler in the chair. The meeting was well attended, and many important matters were discussed and disposed of. Among them was a proposition that the pharmaceutical laboratory of Tulane University, which is under the direction of Mr. A. L. Metz, an alumnus of the College of Pharm. of the City of New York, and the usefulness of which to the profession has been fully recognized, be assisted by a financial contribution necessary to insure its continuance. The proposition was finally adopted, and the sum of \$250 was appropriated for this purpose. A committee of the Association having been delegated to visit the Louisiana State Medical Society, then in session, for the purpose of bringing to its notice the National Formulary, reported that they had been very courteously received, and, after discussion of the matter, the Society had unanimously resolved to accept the National Formulary as the standard for all unofficial preparations. The officers elected for the ensuing year are: President, F. M. Brooks, Baton Rouge; Vice-Presidents, J. B. Lavigne and F. C. Godbold; Recording Secretary, L. F. Chalin; Corresp. Secretary, Mrs. E. Rudolf; Treasurer, E. Brand, all of New Orleans; Executive Committee, L. L. Abbott, Chairman, E. W. Bourg, A. K. Finlay, John Johnson.

The next meeting will be held at New Orleans on the first Wednesday of April, 1890.

College of Pharmacy of the City of New York.—The fifty-ninth annual commencement of the college was held on Tuesday, April 16th, at Steinway Hall, when the following students were awarded their certificates of graduation, or diplomas:

Amend, C. A. L., New York, N. Y.; Arndt, T. H., Jersey City, N. J.; Austin, R. H., Hunter, N. Y.; Bancker, W. D., Jr., Brooklyn, N. Y.; Barsky, Jos., New York, N. Y.; Beardmore, W. H., Leicester, England; Benjamin, F. E., Riverhead, L. I.; Becker, E. F. W., New York, N. Y.; Beekman, H. G., New York, N. Y.; Bird, W. H., Brooklyn, N. Y.; Bischof, E. H., New York, N. Y.; Blatz, Chas. L., Norwalk, O.; Boenau, Th. C., Brooklyn, N. Y.; Boysen, H. C., New York, N. Y.; Brandus, G., New York, N. Y.; Brown, H. E., Brooklyn, N. Y.; Brown, M. C., Gallipolis, O.; Brownell, F. E., Auburn, N. Y.; Bru, J. J., Jersey City Heights, N. J.; Cahoon, Jos. H., Brooklyn, N. Y.; Comstock, Jas. T., Smyrna, N. Y.; Cook, Alb. R., Maracaybo, Venezuela; Daly, P. J., Morristown, N. J.; Davis, W. O., New York, N. Y.; Dimmick, H. H., Plymouth, N. Y.; Eckert, F. H., Jersey City, N. J.; Eisenrager, H. F., New York, N. Y.; Elston, J. M., Newark, N. J.; Evenden, A. W., Newark, N. J.; Fels, P., New

York, N. Y.; Fendler, Amelia M., New York, N. Y.; Fincke, H. S., L. I.; Fischer, E. E., Newark, N. J.; Flood, I., Brooklyn, N. Y.; Foerster, E., New York, N. Y.; Gardner, A., New York, N. Y.; Gelbert, D. G., Scranton, Pa.; Grasser, H. H. R., New York, N. Y.; Hall, G. E., New York, N. Y.; Hay, E. H., Portland, Me.; Hollinger, Aug., New York, N. Y.; Hough, A. E., Newton, N. J.; Hubbard, A. E., Middletown, Conn.; Imhof, G. J. M., Brooklyn, N. Y.; Jackson, A. H., Norwalk, Conn.; James, F. K., New York, N. Y.; Joannes, L. J., New York, N. Y.; Jones, O. F., Brooklyn, N. Y.; Kahrs, W., New York, N. Y.; Kaiser, G. H., New Haven, Conn.; Kalish, O. G., New Britain, Conn.; Keale, Ch. F., Brooklyn, N. Y.; Knoepfel, W. H., Scranton, Pa.; Kugler, W. G., Hoboken, N. J.; Kurtz, H. G., Akron, O.; Levery, J. A., Fairfield, Conn.; Lutz, Ch., New York, N. Y.; Madison, W. H., Brooklyn, N. Y.; Magenheimer, Chr. H., New York, N. Y.; Mahegin, Katherine C., Brooklyn, N. Y.; Martin, J. F. H., Brooklyn, N. Y.; Mathews, H., New York, N. Y.; McDonald, Th. H. A., Cairo, Ill.; McDermott, J., New York, N. Y.; Milligan, R. E., St. John, N. B.; Mills, H. M., Lowville, N. Y.; Millsbaugh, W., Newburgh, N. Y.; Monaghan, Seraphine, New York, N. Y.; Morey, J. H., Saratoga Springs, N. Y.; Murken, A. P., Brooklyn, N. Y.; Ottel, F. A., New York, N. Y.; Oltmann, H. A., Newark, N. J.; Overmiller, N. A., New York, N. Y.; Quencer, W. J., Watertown, N. Y.; Rheineck, W. M., New York, N. Y.; Roese, Jr., W., New York, N. Y.; Schaefer, G. J., Newark, N. J.; Schine, Ch. A., New York, N. Y.; Schmidt, A., New York, N. Y.; Schroeder, F. O., Newark, N. J.; Schwarz, S., Newark, N. J.; Seither, Jr., L. C., New York, N. Y.; Sevin, F. D., Norwich, Conn.; Siemann, F. H., New York, N. Y.; Sniffin, W. S., Port Chester, N. Y.; Sowa, Ch., New York, N. Y.; Spaeth, G. F., New York, N. Y.; Spaeth, O. C., New York, N. Y.; Stein, O. M., Brooklyn, N. Y.; Steinhart, A. P., Brooklyn, N. Y.; Stemmermann, W. H., Newark, N. J.; Strasseberger, G., Montgomery, Ala.; Terry, A. F., Cienfuegos, Cuba; Thum, G. C. E., New York, N. Y.; Trautmann, C. E., Jersey City, N. J.; Voorhees, A. V. B., Bath Beach, L. I.; Walter, H., New York, N. Y.; Weigand, J. A., New York, N. Y.; Wheeler, W. H., Litchfield, Conn.; White, W. S., Dover, N. J.; Williams, Ch. H., Thomaston, Conn.; Williams, G. N., Brooklyn, N. Y.; Woldert, E. A., Tyler, Texas; Wolf, A. S., Middletown, N. Y.; Yarnig, G. E., Adams, Mass.

Alumni Association of the College of Pharmacy of the City of New York.—This year the Alumni Association inaugurated a new departure, making the day of the annual meeting an occasion for a general reunion and a reception of the graduating class, as well as the friends of the students and members. During the exercises the roll of honor of the Junior Class was announced, and prizes were awarded to the three standing highest on the list. The roll is as follows: O. G. Harrison, John P. Arnold, E. B. Wells.—W. J. Robinson, A. L. Goldwater, A. Stierle, Jr., N. P. Snow, A. Dubus, Miss J. A. Britton, A. Lochwing, J. E. Renton, E. T. Smith, W. Schroeder.

CORRESPONDENCE.

Section on Scientific Papers.

EDITOR AMERICAN DRUGGIST.

DEAR SIR:—In calling attention to the fact that the approaching annual meeting of the Am. Pharmaceutical Assoc., to be held in San Francisco, will take place two months earlier than has been the custom to hold this meeting, I also desire to state that all papers should be in the hands of the chairman of this Section at the earliest date possible—by June 1st at the latest. Owing to the distance, it will take a longer time than usual to get the papers in print; and, by the experience of the past two years, it has been proven very desirable to have printed copies of each paper for use at the meeting.

Although it is the intention to have all contributions to this Section put in type, there will, of course, be no publication of any paper, nor copies given out, until the paper is presented to the meeting to be read, when the copies will be circulated amongst the members present.

EMLEN PAINTER,

Chairman Section on Scientific Papers,
Broadway and 34th street, N. Y.

The A. P. A. Excursion to San Francisco, and Cost of the Trip.

EDITOR OF THE AMERICAN DRUGGIST.

DEAR SIR:—In the issue of April 1st of one of the pharmaceutical journals, there appeared a long article concerning the A. P. A. Excursion to California which is in many respects erroneous, and in no way authorized by the association or the committee on arrangements, notwithstanding the statements made purport to be founded upon the official acts of the committee.

In order that those who contemplate making this trip may not be deceived and misled by the article referred to, and without taking it up in detail, I beg that you will publish in your next issue the following statement of facts, for the better information of those who may desire to join the excursion to the Pacific Coast.

In making arrangements for a large party, it is very difficult to fix upon one plan that will suit every one; hence two general plans or excursions were approved by the committee, with the expectation of a large enough

party in each to be able to secure special trains and special privileges and accommodations for both.

The plan of one of these excursions originated with the agent of the U. P. Railway in St. Louis, and has been designated by President Alexander as the "Western and Southern Official Train," of which Dr. Sander was appointed to manage the details. This excursion, as recently announced, is limited to 150 travellers, and starts from St. Louis. Parties east of this point who wish to join this excursion will find it a saving to purchase round-trip tickets from the starting point, and they should correspond with Mr. J. F. Aglar, of the U. P. Railway, or Dr. Enno Sander, 129 S. 11th street, St. Louis, to learn just how and when to join the party.

The expense of this trip, as announced in the circular issued by the U. P. in St. Louis, is \$150 for round trip from that point, with all expenses paid outward, such as sleeping-cars, meals, etc., and railroad fare paid back to St. Louis, but not sleeping-cars or other expenses on the return trip. Sleepers one way will cost \$14.50, and meals 75 cents each. Parties east of St. Louis going by this excursion must add to the above cost the round-trip fare between starting point and St. Louis, besides sleeping-cars and meals. For instance, from New York must be added, fare, \$43; sleeping-cars, \$12; and meals 75 cents each. This would make the total cost from New York, for fare and sleeping-cars, \$219.50, including meals between St. Louis and San Francisco on the trip outward. To which sum for the minimum expense must be added living expenses during the stay in San Francisco and meals, the balance of the trip.

The other excursion approved by the committee on arrangements is the one announced by a circular issued from the office of the chairman of the committee March 1st, and several times reprinted later, adapting it to the different localities. This party is not limited in number, and ample provisions are made for all pharmacists and their friends who will join them—the more the better; nor is it limited to any locality, but may be considered an official excursion of the whole association from all points east of the Rocky Mountains.

The total cost of this trip to the average traveller will not differ greatly from the other, except that the minimum cost is less, and the maximum in either case is just what the individual may choose to make it. For the round-trip ticket and Pullman cars the cost from different central localities will be as follows (as a matter of information, the date of starting is also given):

	Fare.	Sleeping-Cars.	Total.
June 18th, 8:30 A.M., Boston.....	\$148 25	\$43 00	\$188 25
" 18th, 9:40 A.M., New York.....	185 00	41 00	176 00
" 18th, 11:50 A.M., Philadelphia....	183 00	41 00	174 00
" 18th, 8 A.M., Baltimore.....	127 00	41 00	168 00
" 18th, 8:55 A.M., Washington....	125 00	41 00	166 00
" 18th, 11:45 P.M., Buffalo	123 40	37 00	159 40
" 18th, 11:20 P.M., Pittsburgh.....	121 10	36 00	157 10
" 14th, 8:10 P.M., New Orleans....	92 00	30 00	122 00
" 14th, Memphis	92 00	29 00	121 00
" 14th, 8:20 P.M., St. Louis	92 00	29 00	121 00
" 14th, 7:30 P.M., Chicago	100 00	31 00	131 00
" 15th, 10 A.M., Kansas City....	80 00	26 00	106 00
" 15th, 7:30 A.M., Omaha	80 00	26 00	106 00
" 18th, 7:30 A.M., Denver	70 00	22 00	92 00

These Pullman car charges are for double berths, which may be used by one or two persons at the option of the travellers; if occupied by two, the sleeping-car charges for each will, of course, be just one-half of the price above given.

To this total must be added cost of meals and hotels en route and during the stay in San Francisco, which will range from \$1.50 to \$5 a day, according to the individual, as his inclination may be extravagant or otherwise.

The northern route has been selected as the most interesting for the return trip, which will cost \$15 additional fare. This sum must be paid at the point the overland ticket is obtained (Chicago or the Missouri River as the case may be), at which point the return route must be decided upon, whether the Northern Pacific is selected or not. Passengers may return by any of the transcontinental lines terminating in San Francisco, without additional cost.

All tickets by whatever route are good for six months from date of purchase, with stop-over privilege wherever desired. Tickets can be purchased at any Central Railroad office, and the travellers can join the excursion at the most convenient point. The chairman of the committee should be promptly notified by those who contemplate going, so as to enable him to make the necessary arrangements, and a deposit to cover the sleeping-car charges should be made not later than June 1st.

Arrangements have been made with the railroad companies for both excursion parties to have elegantly appointed special trains, run on special time, so as to better secure the pleasure and comfort of the travellers.

Circulars and illustrated pamphlets descriptive of the route and any further information desired on the subject will be cheerfully furnished by the undersigned.

EMLEN PAINTER,

Chairman Com. on Arrangements, A. P. A.,
Broadway and 34th street, New York.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,309.—Dry Plates (H. B.).

It is altogether outside of the scope of this journal to go into the details of the process of making dry photographic plates. But we will refer you to some good authorities, viz.: *Scientific American Supplement*, numbers 205, 299, 190, 384, and a work just published: "The Processes of Pure Photography," by W. K. Burton and Andrew Pringle, sold by The Scovill & Adams Co. of New York (\$2.00).

No. 2,310.—Oleite or Polysolve (supplement to query 2,276).

In referring to our answer to query No. 2,276, in which we were asked what "oleite" was, Messrs. Lehn & Fink announce that all rights to the process for manufacturing polysolve have been secured by patents, held by the inventor and controlled by Messrs. Lehn & Fink. The last-named fact was not known to us. As to whether the names "oleite" or "solvin" are legitimate synonyms, we must refer our reader to the patentee himself.

No. 2,311.—Prescription Query (F. H.).

This correspondent asks why a precipitate is formed in the following mixture on standing:

R Tr. Aurantii.....	f. 36
Vin. Colch. Rad.....	f. 34
Potass. Iodid.	32
Potass. Carbon.....	32

M. Fiat sol.

The precipitate is partly carbonate of potassium, which is not altogether soluble in the menstruum, as the latter contains altogether about 40 per cent of alcohol. Besides, the alkaline carbonate precipitates a small quantity of the constituents of both of the tinctures. By omitting the carbonate of potassium, the prescriber would enable the apothecary to dispense a better-looking mixture.

No. 2,312.—The Manufacture of Fruit Essences (Omaha).

We do not think that it would pay to undertake the manufacture of fruit essences, unless the works could be run in connection with others from which the several materials necessary in the preparation of the essences could be obtained at self-manufacturing prices. Moreover, the depot for their sale must be at certain prominent trade centres.

The most important, and at the same time troublesome, constituents of these essences are certain compound ethers, principally derived from the amyl series. And it is here where the facilities of a few manufacturers enable them to prevent all competition.

If our correspondent has a steady demand for artificial fruit essences, we believe he might make a special contract with one of the large manufacturers of the fruit ethers at very advantageous terms.

No. 2,313.—Amount of Carbonic Acid from Sugar by Fermentation (Brooklyn).

It has been determined by careful experiments (for instance, by Jodlbauer) that cane-sugar and anhydrous maltose yield, upon perfect fermentation, 49 per cent (more exactly 49.04 per cent) of carbonic acid gas, while dextrose yields 46.54 per cent. The following table gives a comparative view of the principal results from 100 Gm. of each of the following sugars:

	Cane-sugar.	Dextrose.	Maltose, cryst.	Maltose, anhyd.
Alcohol.....	51.11	48.67	45.87	51.08
Carbonic Acid Gas.....	49.08	46.54	46.59	49.04
Succinic Acid + Glycerin.....	8.96	8.71	8.74	8.95
Undetermined.....	1.01	0.94	0.90	0.95
Total.....	105.11	99.86	99.60	105.02

The most favorable temperature for alcoholic fermentation is 34° C. (93.2° F.), and the most favorable degree of fermentation of the liquid is one corresponding to 8 per cent of sugar.

No. 2,314.—Wine Vinegar (Richmond).

Public analysts are pretty well agreed regarding the criteria by which genuine cider vinegar is recognized. Regarding wine vinegar, the agreement is less perfect, no doubt because a much smaller amount of this is sold in our market. A recent paper by Hugo Eckenroth (in *Pharm. Zeit.*) contains some useful data which may be of use to our correspondent:

The specific gravity of white wine vinegars varies between 1.0116 and 1.0147. If it is below 1.010 the presence of alcohol is rendered probable, though this is rare. On evaporating a weighed quantity of wine, and drying the residue at 105° C. for several hours, until it ceases to have an odor of acetic acid, it should leave between 0.35 and 1.51 per cent of residue. Wine vinegar seldom contains more than traces of glycerin, the amount being usually between 0.05 and 0.1 per cent. The quantity of acetic

acid varies between 4 and 7 per cent: a good wine vinegar should contain at least 6 per cent. Of course, for actual use, such vinegar may be suitably diluted. Tartaric acid is present in all wine vinegars. To determine it, not less than one pint, better one quart, of the vinegar should be used. The total ash of wine vinegar rarely exceeds 0.25%; usually it is not more than 0.15%; and the ash always contains phosphoric acid.

No. 2,315.—Paraldehyde (Portland).

The following characterization, given by the recently published Pharmacopœia Hungarica, may serve you as a guide, until our own pharmacopœia shall give a description and tests based upon independent investigation:

Paraldehyde is a colorless liquid of a peculiar aromatic and suffocating odor. It has the spec. gr. 0.998, and boils at 124° C. When cooled to a temperature of +10° C., it congeals to a deliquescent, colorless, crystalline mass. It is soluble in 10 parts of water, and miscible with alcohol and ether. The cold-prepared aqueous solution becomes cloudy on boiling. On adding an aqueous solution of paraldehyde to ammoniacal solution of nitrate of silver, mixed with 1 drop of solution of soda (cont. about 33 per cent of caustic soda), and warming, metallic silver will be separated. Paraldehyde should have a neutral reaction, should congeal at the temperature of melting ice [according to above, already at +10° C.], and be completely volatilized at a temperature of 124° C. On warming 5 to 10 Gm. for some time on a water-bath, the liquid should completely evaporate without leaving a fixed residue having a foreign odor. The aqueous solution should not be rendered turbid by silver nitrate. Maximum single dose: 3 Gm. (45 grains); maximum daily dose: 6 Gm. (90 grains). Paraldehyde should be kept in a carefully stoppered bottle, protected from the light.

No. 2,316.—Rubber-Stamp Ink (Harrisburg).

The usual rubber-stamp inks are prepared with water-soluble aniline colors and glycerin. A good formula, which we have tested practically, is given by Dieterich:

Blue Rubber-Stamp Ink.

Aniline Blue, water-sol., 1 B.....	3 parts.
Distilled Water.....	10 "
Pyroligneous Acid.....	10 "
Alcohol.....	10 "
Glycerin.....	70 "

Mix them intimately by trituration in a mortar. [The blue should be well rubbed down with the water and the glycerin gradually added. When solution is effected, the other ingredients are added.]

Other colors are produced by substituting for the blue any one of the following:

Methyl Violet 3 B.....	3 parts.
Diamond Fuchsin I.....	3 "
Methyl Green, yellowish.....	4 "
Vesuvius B. [brown].....	5 "
Nigrosin W. [blue-black].....	4 "

If a bright-red ink is required, 3 parts of eosin BBN are used, but the pyroligneous acid must be omitted, as this would destroy the eosin. Other aniline colors, when used for stamping ink, require to be acidulated.

No. 2,317.—Biniodide of Potassium (New York).

A prescription was recently presented to a pharmacist of our acquaintance which read as follows:

R Potass. Biniodidi.....	gr. xx.
Hydrarg. Biniodidi.....	gr. ij.
Eliz. Taraxaci Co.....	fl. oz. ij.

He had no chance of communicating with the prescriber and declined to put it up, as there is no such preparation as "biniodide of potassium," and he did not wish to make any change in the prescription himself. Of course, it is evident that the prescriber meant to write "Potass. Iodidi," and that he was already thinking of the next line, thus writing the word "biniodidi" twice. Our friend informs us that the prescription was taken to another store and there unhesitatingly dispensed, the parties in charge asserting that they had every ingredient and were able to put it up. Now, even if there ever had been a biniodide of potassium in the market, this could only be a mixture of 1 molecule of iodide of potassium and 1 atom of free iodine—a compound which would produce alarming or fatal results, if used in doses like the simple iodide. Hence the statement on the part of the dispensers, that they were able to put up the prescription, was evidently a prevarication, and they probably dispensed simply iodide of potassium. But we cannot approve the conduct of the dispensers, as it was clearly their duty to notify the prescriber of his blunder, to prevent him from repeating it, or else to decline to dispense the prescription.

No. 2,318.—Selters Water (A. J.).

Selters water is obtained from four springs joined together to a well at Niederselters, situated near Wiesbaden, on the Emsbach. It is a mineral water characterized by the presence of considerable chlorides, a moderate quantity of carbonates, and a small amount of sulphates. The natural water contains a great number of constituents, some of them only in very minute quantities. The temperature of the natural water is about 61–62° F. In making imitations of natural mineral waters, it is impossible to bring into solution, or at least to maintain in solution,

every one of the natural constituents, even if it were possible to dissolve them. It has, therefore, long been customary to omit, in artificial mineral waters, any secondary ingredients, or such as were deemed immaterial, and which would eventually produce cloudiness or a precipitate, for it would not be possible to sell such waters. What is generally sold here as selters, in siphons, is an artificial product, usually made by dissolving merely chloride, carbonate, and sulphate of sodium in water, and charging the solution with gas. For the ordinary table purposes, such a water serves probably well enough. But it can hardly be expected that much remedial effect will be obtained from it.

Basing upon Fresenius' analysis, Dr. Heinrich Raspe proposes to employ the following ingredients for making the artificial water:

	Parts.		Parts.
Potass. Chloride,	0.572	Magnes. Sulphate,	0.283
Ammon. "	0.052	Iron (ferrous) Sulphate,	0.040
Sodium "	16.762	Manganous "	0.007
Lithium "	0.036	Sodium Bicarbonate,	20.389
Magnesium "	3.061	" Nitrate,	0.061
Calcium "	3.419	" Phosphate,	0.008
Strontium "	0.028	" Silicate,	0.425
Barium "	0.0017	In Water,	10,000
Aluminium "	0.0047		

charged with carbonic acid gas. The natural water contains 1184.6 C.c. of CO₂ in 1 liter.

In the neighborhood of Niederselters are found several other springs which yield practically the same water. These are likewise exported and sold as selters or selzer.

No. 2,319.—Citro-chloride of Iron (D. F.).

Citro-chloride of iron is a name applied to a compound produced by bringing together ferric chloride and the citrate of an alkali in certain proportions, which results in the more or less complete transposition of the bases and acids, bringing about a most remarkable change of physical and chemical properties. Thus, while ferric chloride has a most decided astringent and ferruginous taste, the new compound is practically free from these characteristics, and for this reason its solution, containing some alcohol, is very commonly called "Tasteless Tincture of Iron." Regarding the exact chemical constitution of the compound various theories have been offered, but no absolute certainty has been reached. Until this has been cleared up by further chemical research, there will be no harm in assuming—temporarily, of course—that the new compound consists mainly of ferric citrate and the chloride of the alkali, with such an excess of the citrate of the latter as did not enter the reaction.

Now as to the tincture of citro-chloride of iron, we would refer you to the National Formulary, where the formula is given under No. 397. As we wish to append a short note to this, we will first quote the formula:

Tinctura Ferri Citro-chloridi.

Tincture of Citro-chloride of Iron.

Tasteless Tincture of (Chloride of) Iron.

Solution of Chloride of Iron (U. S. P.).....	4 fl. oz.
Citrate of Sodium.....	7 tr. oz.
Alcohol.....	24 fl. oz.
Water.....	enough to make 16 fl. oz.

Mix the solution of chloride of iron with 4 fl. oz. of water, and dissolve in this mixture the citrate of sodium with the aid of a gentle heat. Then add the alcohol, and, when the solution has become cold, make up the volume with water to 16 fl. oz. Set the product aside in a cold place for a few days, if convenient, so that the excess of saline matter may separate. Then filter, and pass enough cold water through the filter to restore the original volume.

Each fluidrachm contains an amount of iron equivalent to about 71 grs. of dry chloride of iron (ferric).

This preparation is practically identical in strength of iron, but not in the quantity of alcohol, with the official tinctura ferri chloridi.

When the preceding formula was discussed and tried by the Formulary Committee, citrate of potassium was directed to be used. Prolonged experience with the process, however, showed that a very copious precipitate was produced in the final tincture when this salt had been used. This is owing to the fact that chloride of potassium (of which most of the precipitate consists) is much less soluble in the menstruum of the "tincture" than chloride of sodium. For this reason citrate of sodium was substituted for citrate of potassium. But as the former salt is not always to be had, and there is no necessity of first preparing it in a dry state and then again dissolving it, an equivalent of the 7 troy ounces of the salt may be obtained as follows:

Bicarbonate of Sodium.....	2,280 grains.
Citric Acid.....	4,160 grains.
Water.....	q. s.

Dissolve the citric acid in 7 fl. oz. of water, gradually add the bicarbonate of sodium, and heat gently until perfect solution has taken place and no more gas is given off. Then add the solution of chloride of iron, and the alcohol. Allow to cool, and proceed further as directed above.

Information Wanted.

What is Radam's Microbe Killer?—A. H. K.

American Druggist

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Whole No. 180.

[ORIGINAL COMMUNICATION.]

SYRUP OF HYDRIODIC ACID.

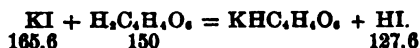
BY OTTO RAUBENHEIMER, PH.G.

THE following is a formula of "Syrupus Acidi Hydriodici Decolor," which will not darken on exposure to sunlight, a change that occurs in the syrup made after the N. F.*

A sample of this syrup has been kept in the shop window for about a year, exposed to the direct rays of the sun, without coloration or decomposition:

Sodium Hypophosphite.....	gr. 2
Potassium Iodide.....	gr. 140
Dissolve in	
Water.....	fl. dr. 6
and add	
Glycerin.....	fl. oz. 2
Then add	
Tartaric Acid.....	gr. 127
dissolved in	
Alcohol.....	fl. dr. 6
Set aside in a cold place for three hours, and add	
Syrup.....	enough to make fl. oz. 16

The amount of KI + H₃C₂H₃O₃ is calculated from the equation:

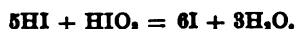


One fl. oz. of the finished syrup = 6.72 grs. HI = 6.66 grs. I. The same strength as Gardner's.

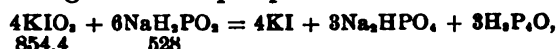
This process has the following advantages:

1. It is the glycerin that preserves this syrup so well.
2. The complete precipitation of H₃C₂H₃O₃.
3. The use of hypophosphite instead of hyposulphite—thiosulphite—recommended by some authorities.

The commercial KI always contains a trace of KIO₃, but this trace is sufficient to set free iodine in connection with HI.



It is the hypophosphite that reduces the iodate to iodide, itself being oxidized to phosphate:



showing that 1 part sod. hypophos. will reduce 1.6 part of pot. iodate. This change happens before the H₃C₂H₃O₃ is added, the result being a pure KI, and consequently a pure solution HI without free iodine.

HOBOKEN, N. J., March 12th, 1889.

[ORIGINAL COMMUNICATION.]

DECOCTIONS AND INFUSIONS VS. ALCOHOLIC PREPARATIONS OF PLANTS.†

BY J. U. LLOYD.

FROM time to time I am confronted with the fact that elaboration in pharmaceutical work is not always improvement—real improvement. I accept without question that the primary object of the pharmacist should be the therapeutical value of his products; elegance and physical appearance being very important considerations, but they are secondary. That I am a zealous advocate of pleasant medicines and a presentable form of remedies, and that I dislike, even detest, useless dirt in pharmaceutical preparations, even to the point of occasionally becoming ethically irregular, is known, and I candidly admit that in some instances the decoction or infusion of a crude drug seems to me superior to any known elaborated product of it.

That this statement is at variance with the commercial-return side of the life of the manufacturing pharmacist is true, and that my own pecuniary interests, if I consulted them, should prompt me to remain quiet is undeniable; and, lastly, that I may be criticised by some of my co-laborers in pharmacy for drawing your attention to these truths is probable. They are facts, however, and should not be covered under a bushel, and I bow to the necessity that compels an expression of my opinions.

I will candidly say that, in accepting the fact that alcoholic liquid representatives of plants are often desirable, we are being drawn in some directions over broken ground. In my opinion, we should differentiate more; the rule of elaboration is usually a good one, but there are many exceptions to the employment of any alcoholic menstruum in plant extraction. The thrusting of a line of alcoholic fluid extracts, now typical of this class of

preparations (followers of the alcoholic tinctures and essences), upon the profession has been conducive of injury as well as benefit. Manufacturers and physicians together have broadly accepted in this direction, often without proper discrimination, and, if my opinions are worthy of consideration, a halt should be called by physicians. Do not discard *all* of your infusions and decoctions because the majority of them may be better replaced with more refined drug representatives. Because a manufacturer or apothecary, by expert manipulation and attentive study, has evolved exceptionally effective alcoholic representatives of many plants, and made the practice of medicine with these agents more certain and the physician's relation to his patient more pleasant, do not argue that you can on general principles discard all that is old in favor of the new.

It disturbs me, as it probably does some other manufacturers, to be compelled to make certain pharmaceutical preparations that I know must be inferior products, simply because it is the fashion, and sometimes I am so rude as to rebel. True, they yield a commercial return, are usually profitable, but they are often worse than unnecessary. I realize that physicians using them will afterward resort to the more crude form of the drug, or drop it altogether, believing it to be worthless. But they lose time in thus groping about, or may lose a valuable life.

The introduction of a line of substances known as fluid extracts, made practically by a universal rule, has led, I believe, to some marked disturbances of this nature. Drugs that cannot properly be extracted with an alcoholic menstruum are too often thrust forward as unquestionably represented in an alcoholic form, and are so demanded by physicians.

Take the mucilaginous bark of the *elm*, a drug that should be stripped fresh from the tree, torn into shreds, and suspended in cold water, in order to produce the soothing, cooling, mucilaginous drink that is so refreshing to feverish patients. Its richness depends on its freshness. Each day this mucilage should be prepared anew, and the vessel containing it should be kept in a cold situation, and outside of the sick-room, to avoid absorption of foul exhalations. Is it not illogical to substitute for that mucilage a burning alcoholic "fluid extract" that neither can contain the mucilage of the bark, nor replace to the parching patient the grateful drink that may be prepared from fresh elm? Pass to other drugs, somewhat of this description, comfrey, benne, quince seed, and the same rule may be applied. The fresh infusion made with cold water is the best preparation, and every drop of alcohol added is at the expense of the value of the preparation. I do not hesitate to say that, in my opinion, a so-called fluid extract or tincture of such a drug is not a desirable preparation.

Consider now another class, drugs which, if we want to obtain positive effects, must be administered in large doses, and I believe that few persons will question that there is a like inconsistency in making alcoholic extracts of them. Pomegranate bark, pumpkin seed, male fern root, are all recognized as effective remedies in their sphere, but to be effective they must be given in quantities often inordinately large. The reputation of these remedies as employed in crude form, such as decoction, is not imaginary: they bring the answer unmistakably. This reputation was made by *decoctions* (oleoresin of male fern is valuable), has been maintained by decoctions, and will probably be retained in a like manner. That fluid extracts of all of them are sold, are ordered, are consumed, I do not deny, but that any of the alcoholic preparations are reliably effective I doubt. Better by far save money, save time, make reputation, by following the original method; prescribe a strong decoction of the drug, and administer it freely.* As a sialagogue, jaborandi appeared before the medical world under the introduction of an unquestionable authority, Dr. Ringer, who used it in *infusion* only. The record of its field of usefulness seems to be thoroughly demonstrated when it is taken in hot decoction, the reports being that the sweating was increased and more quickly induced when the *dregs as well as the decoction were swallowed by the patient*. To-day this drug is practically discarded (although highly commended in print), and the medical jury that pronounced the sentence relegating it to obscurity employed the fluid extract of jaborandi, a preparation altogether different from that used by its introducers.†

I rebel against such preparations as fluid extract of kino and fluid extract of catechu, and have displeased some patrons by refusing to make them. Other cases can be cited in which "fluid extract" inconsistencies occur, but it is unnecessary, although I might say that, in my

* In our experience, and that of many others, the syrup made after the Nat. Form. remains colorless, or practically so.—ED. AM. DRUGG.

† Read by request at the meeting of the Ohio Eclectic Medical Association, Akron, May 16th.

* Tannate of pelletierine is reported to be an efficacious representative of pomegranate bark.

† I do not overlook the alkaloidal constituent which should be a constituent of the fluid extract. This alkaloid is said to be of value, producing copious perspiration.

opinion, a decoction of apocynum is effective where an alcoholic preparation is useless,* and that the elaborate formula of the United States Pharmacopœia (1880) produces a fluid extract of chestnut inferior to an infusion of chestnut leaves. The lessons of these examples will, I think, be evident, and kindly considered. If I wished to administer to a member of my family pennyroyal, peppermint, sage, boneset, or other of most of the domestic remedies and many drugs now only known to the profession in fluid extract form, I would surely make a "tea" or decoction, and not give a fluid extract or tincture. I am a maker of fluid extracts and other similar preparations, and hence cannot be criticised by fair-minded persons for advising physicians of this society, who are largely my patrons, to benefit themselves and the patients, as I do now, at my own expense.

The evolution of pharmacy may yet give us positive testimony that will teach us where the decoction and infusion should rest and be supplanted by alcoholic preparations; but we have not yet in pharmacy reached that point. Of the comparative values of these classes there is little recorded; in many (perhaps most) directions, nothing is known, and I therefore freely say that, in my opinion, this fluid-extract hobby has been carried in some directions to extremes. The apothecary, the manufacturer, the physician seem to have crushed themselves together, and regardless of compatibles or incompatibles, of consistency or inconsistencies, have rushed thoughtlessly into an alcoholic craze. Deserving and commendable in many particulars, objectionable in others, I view fluid extracts as one of the stepping stones to a more perfect pharmacy which, by a series of evolutions, is destined to produce substances that will surely displace them in the future. They are a crudeness of the present, although they have improved our medicines in some directions by displacing others more crude, or given us portable preparations, but have in many cases crowded our shelves with preparations very much inferior to the decoctions and infusions, or even the crude drugs, that have been displaced. I do not propose to try to defend myself for the part that I have taken in this record, for I do not deny that my zeal in the past has helped to fasten the habit on others, neither do I close my eyes to the fact that many manufacturing pharmacists and their friends may even now decline to accept the situation as I see it.

In connection with this subject, I will candidly say that my experience has impressed me with the fact that, were I a physician, I should call upon the apothecary in numbers of instances for extemporaneously made infusions and decoctions, and should pay him for his services rather than prescribe several of the fashionable, ready-made, alcoholic preparations of the same drugs; or, I would direct them to be made at the bedside in the usual domestic manner.

New Method of Making Hydrobromic Acid.

V. MERZ and E. HOLZMAN have studied the conditions under which hydrobromic and hydriodic acids are generated from the elements, and have found, at least for hydrobromic acid, a new practical process by which it may be prepared on the large scale. The process involves certain features which will have to be specially provided for, such as a constant, and of course cheap, current of hydrogen. But this is easily provided for.

The new process is as follows:

Conduct a rapid current of hydrogen, impregnated with much vapor of bromine, produced by warming bromine in a flask, successively through

1. A combustion tube (of glass, such as is used for ultimate analysis), kept at a low red heat in the combustion furnace;
2. Through a Woulf's bottle having three tubulures, into one of which an additional current of hydrogen passes to help carry forward the products of combustion;
3. Through a second, short combustion tube, at a red heat; and
4. Into pure water.

The object of the interposed Woulf's bottle is to permit a control of the quantity of bromine vapor produced by warming the flask containing it. Its quantity is recognized approximately by the more or less strong tint of the current of gas. If the latter is but slightly tinted, it will cease to contain free bromine after having passed the second combustion tube. In this way a colorless solution of hydrobromic acid gas is obtained, which may be made so concentrated as to become fuming.

The authors think it would be an additional advantage—in order to insure the entire absence of free bromine in the product—to pass the mixed current over metallic antimony before it is made to enter the water. But, as Harding has pointed out (see *NEW REM.*, 1882, 43), the current must be cold when it passes the antimony. Suitable provision must therefore be made to cool the current. —After *Berichte*, 1889, 868.

Antipyrin and Quinine.

It has recently been pointed out that antipyrin possesses the property of increasing the solubility of some salts of quinine. If 0.4 to 0.5 Gm. (6 to 8 grains) of antipyrin be added to 1 Gm. (16 grains) of quinine hydrochlorate, it will dissolve in 2 Gm. of water at a temperature of 20°–31° C.; and with only 0.2 to 0.25 Gm. (3 to 4 grains) added, it will dissolve at 44°–50° C. Without any addition, 1 Gm. of quinine hydrochlorate requires a temperature of 53° to 56° C. to dissolve it in the same quantity of water. Moreover, whilst upon cooling the quinine salt, if alone, crystallizes out at once, the quinine-antipyrin solution can be preserved a long time unaltered. The almost insoluble valerianate of quinine behaves similarly. Possibly this fact may be utilized in preparing hypodermic solutions of quinine.—After *Ph. Journ. and Apoth. Zeit.*

Antipyrin and Sodium Salicylate.

MR. PRUDHOMME recently called attention to the incompatibility of antipyrin with a salicylate, and advised that they be never combined together in form of powder. In commenting upon this (in *Bull. Comm.*, March 31st), Mr. Vigier said that these compounds, when dispensed in contact with each other in the dry state, appear to undergo decomposition, whether the crystallized or the amorphous salicylate be used, with the formation of an oily liquid that renders the mass pasty, and may in 24 hours constitute 10% of the whole. No perceptible alteration takes place, however, in a solution of the two compounds. Although the reaction of sodium salicylate is faintly acid, the pasty product of the salt with antipyrin is alkaline. A solution of the two compounds, however, remains acid.—*Pharm. Journ.*

Arsenic in Glass and in Soda.

W. FRESSENIUS and U. KREUSLER some years ago announced that they had met with glass containing arsenic, in Germany. This is now also announced by J. Marshall and Charles S. Potts (in *Amer. Chem. Journ.*, 10, 425), who found in three different kinds of glass of German origin 0.095 to 0.127% of arsenious acid, and in four specimens taken from a Philadelphia glass factory 0.191 to 0.446%. They also examined caustic soda and carbonate of sodium, and found arsenic in every sample, except those prepared by Solvay's process.

On keeping a 10% solution of soda in bottles made of arsenical glass, distinct traces of arsenic were taken up by the solution after 96 hours. A 10% potassa solution required only 24 hours to absorb traces. It seems that only alkalies withdraw arsenic. On keeping strong sulphuric or hydrochloric acid in such arsenical flask, not a trace of arsenic is taken up after several days. Other reagents have likewise been found to be non-absorbent.

Iodate of Calcium as a Disinfectant.

DR. KLEIN has studied the antiseptic and disinfectant effects of iodate of calcium, and reports that it is a moderately powerful agent in many cases, though it will not destroy the more resistant spores or bacilli, such as the bacillus anthracis of the blood, the cholera bacillus of Koch, etc., etc. It has, however, this advantage over corrosive sublimate, that it is not poisonous, at least in the quantity in which it would likely be taken if a liquid containing it were accidentally swallowed. A solution of 1 in 500 is sufficiently effective as an ordinary disinfectant, and certainly more powerful than a similar one of carbolic acid.—After *Brit. Med. J.*

The True Way to "Make Coffee."

DR. W. JUNKER, the African traveller, makes the following remarks on making coffee in his recent work, "*Reisen in Afrika*" (Wien and Olmütz, 1889, pg. 208):

Any European who believed that the decoction of coffee-beans which he had tasted at home deserved the name of "coffee," is soon convinced of his error after sojourning for a while in Turkey, Egypt, or Arabia. He will, indeed, at first be somewhat surprised always to find some sediment in his cup, which he is apt to overlook until he has swallowed some. But he will soon learn to sip the aromatic liquid carefully from off the sediment. . . . The proper way to prepare coffee is as follows: The beans, which should, of course, if possible, be of the very best quality (genuine Mokka), are carefully examined, and all damaged ones picked out, constituting then what is known as *el-bunn es-saafi*. Immediately before use, the requisite quantity is freshly roasted and powdered, which latter is preferably done in a wooden mortar. The powder should be quite fine, like flour. Water having been brought to a boil in a suitable kettle or vessel, a certain quantity of the powder—a small spoonful for every small cupful of coffee to be drawn from the vessel—is added, the whole stirred, and the vessel replaced on the fire until the liquid boils and foams up. It is then removed, and the coffee served.

* Prof. Thomas recently read a paper before the Cincinnati Society, speaking in the same way of apocynum

THE ART OF DISPENSING.*

(Continued from page 88.)

INGREDIENTS OF PILLS AND HOW TO MASS THEM.

Acetate of Potassium, which seems one of the most unreasonable things to put into a pill, makes, according to Whittla, a good mass with Canada balsam, and remains stable. A more desirable mass is obtained with borotartarate of potassium—for example, acetate of potassium, 18 parts; borotartarate of potassium, 3 parts; water, 1 part, can be made into pills without much difficulty, and they keep well in corked bottles.

Acids of mineral origin are rarely, if ever, prescribed in pill form, unless it be an occasional German prescription. With the addition of powdered marshmallow root and glycerinated water, good plastic masses are obtainable, as, for example:

Pepsin.....Gr. 40
Powdered Rhubarb....." 80
Extract of Gentian....." 24
Muriatic Acid.....gtt. 20
 (Marshmallow powder and glycerinated water, each gr. 8).

To make 100 pills.

Such pills should be dispensed in a bottle.

Benzoic Acid makes a good mass with a drop of glycerin to every 5 grains, but Canada balsam generally gives better results, especially when the balsam is fresh and thin.

Gallic Acid makes a good mass with an eighth to a sixth of its weight of glycerin.

Aloes in any fair proportion, and particularly when combined with colocynth, scammony, and soap, is best made into pills with compound decoction of aloes. It has great solvent power and must, therefore, be used sparingly. The many compounds of aloes, mastic, and soap are best massed with this excipient, but the dispenser must guard against chemical action. The value of this excipient lies chiefly in the carbonate of potassium, which is an active solvent of organic substances, but not in every case a desirable ingredient. Aloes alone is better handled by adding some fibrous material, and if massed with mucilage of gum arabic, and rolled out quickly, the pills keep their shape very well. Large quantities should be made with the aid of a hot plate.

Antipyrin.—Use 1 grain of tragacanth with each 5 grains, and as little water as possible.

Balsams, Oils, etc.—Pill masses are sometimes required with fluid or soft resins, fluid balsams, oils, or fats, as ingredients. When the quantity of these is too large to admit of the formation of a mass by the addition of any reasonable quantity of powder, recourse must be had to wax. Balsam of Peru, copaiba, extract of male fern, oleoresin of cubeb, creosote, carbolic acid, ethereal oils, and other substances, melted by gentle heat with one-third to an equal weight of wax, yield, according to Hager, very good pill masses, but the mixture must be quite cold before combination with any other ingredients. The addition of ether or spirit destroys the plasticity of this compound. The wax, with the medicament, must be melted very slowly in a porcelain dish, as the application of a strong heat would be likely to injure the medicinal properties. In using wax, the dispenser must be careful that he does not bring the resulting mass to such a degree of hardness that the pills will not disintegrate in the alimentary canal. This is the great objection to the use of wax. An ordinary pill, though much harder than a wax pill, may dissolve in the stomach, because its ingredients are soluble in water. Wax pills are generally insoluble in water, and it must be concluded that they are of little, if any, medicinal value.

Balsam of Peru is seldom ordered alone in pills. When demanded, it may be massed with slaked lime, in fine powder, 15 grains being sufficient for 30 grains of balsam. Two drops each of castor oil and alcohol aid the formation of a good mass, which should stand for an hour before being rolled.

Copaiba was formerly much used in pill form, and carbonate of magnesium was the favorite excipient; but the mass becomes of stony hardness and quite insoluble. A better plan is to make a gum emulsion, and then add 1 part of calcined magnesia for every 10 parts, by weight, of the balsam. In about twelve hours the emulsion will have become of the consistence of a cerate, when the addition of a little borax will give an excellent mass, which keeps for a long time and requires only to be worked in a warm mortar when it is old. Pills made in this way are extremely soluble in the digestive fluids. Phosphate of calcium is also a good excipient.

Butyl-Chloral Hydrate (croton chloral) should not be combined with such substances as confection of rose or extract of gentian, owing to its giving a dark-colored mass. Whenever possible, white substances should be made into white pills. Equal parts of powdered acacia, tragacanth, and syrup make a good pill of this substance.

Calcium chloride does not give pills which silver well,

unless special precautions are used. Use Canada balsam to make a mass, and coat the pills with tulu dissolved in ether. After five minutes moisten them slightly with thin mucilage applied by a finger and thumb, and drop them into the silver leaf; then proceed as customary, and send the pills out in a corked bottle to prevent absorption of moisture.

Calomel makes a very good mass with manna, or the following:

Calomel.....gr. xxiv.
Powd. Tragacanth.....gr. ij.
Confection of Rose.....q. s.

Camphor generally gives trouble. Use sublimed camphor or reduce it to fine powder with the help of a little alcohol; then, if the pill is to contain camphor simply, mass with glycerite of tragacanth, or use 1½ grains of carbonate of ammonium to each half-grain of camphor. Some dispensers prefer using for each pill of 3 grains of camphor a half-grain of soap and half a drop of olive oil. Another method, for large pills, is the following:

Camphor.....gr. xxiv.
Castor Oil.....gtt. iij.
Soap.....gr. ij.

M. Make six pills.

When any green extract is ordered with camphor, powder the latter with the aid of a little water instead of alcohol. The extract will then make a good mass, which retains its consistence for some time. If the extract should give too soft a mass, it may be stiffened with powdered curd soap ["curd soap" is ordinary soda soap made with tallow or other animal fats] or a mixture of curd soap with powdered licorice.

When there is a large proportion of a gum-resin in a mass, alcohol is a good excipient, as in the following cases:

Powd. Asafoetida.....℥v.
Oxide of Zinc.....gr. xij.
Powd. Camphor.....gr. vi.
Extract of Belladonna.....gr. iij.

To be made into 24 pills.

Extract of Belladonna.....gr. iv.
Powd. Camphor.....3 ss.
Sulphate of Quinine.....3 i.
Sulphate of Zinc.....gr. x.

To be made into 30 pills.

In the last example, powder the camphor by the aid of a drop or two of water and the zinc sulphate, add the quinine and extract, with a few grains of tragacanth, and make a mass with a mixture of 2 parts of simple syrup and 1 of glycerin.

Carbolic Acid in crystals is especially convenient for making pills, and the excipients commonly used are wheat flour, powdered soap and licorice, soap and tragacanth with glycerin, powdered marshmallow with a trace of glycerin, etc. Success with either of these depends greatly upon habit.

The excipient to be used must depend upon the nature of the mass. For example:

Subnitrate of Bismuth.....gr. iij.
Carbolic Acid.....gr. i.

This makes a good pill by incorporating with the acid a half-grain of powdered curd soap, adding the subnitrate, and massing with a very little glycerite of tragacanth.

Resin of Podophyllum.....gr. ½.
Compound Rhubarb Pill.....gr. iij.
Carbolic Acid.....m. i.

Incorporate the phenol with an equal weight of soap; then add the powdered ingredients of the compound rhubarb pill, the podophyllin, and a little powdered tragacanth. Mass with a little molasses. (See also Creosote.)

Cascara Sagrada Extract.—Stiffen with powdered tragacanth and licorice, and varnish the pills.

Corrosive Sublimate in pills should first be rubbed to fine powder with twice or thrice its weight of sugar-of-milk, and the other ingredients, excepting the excipient, added little by little, so as to insure a perfect mixture. Some authorities insist that all potent substances should be combined in a state of solution, as, for example:

Corrosive Sublimate.....gr. i.
Glycerin.....gr. i.
Confection of Rose.....gr. v.
Powdered Acacia.....gr. x.

To make 8 pills.

The mercurial being dissolved in the glycerin, perfect distribution is secured. If it be dissolved in ether and the solution triturated with powdered licorice, the salt is very finely divided. Dzondi's sublimate pills are made with 0.75 Gm. of corrosive sublimate with bread-crumbs and sugar, of each sufficient to make 250 pills. The salt should be thoroughly mixed with 3 Gm. of sugar; to this 10 Gm. of sugar, 18 Gm. of dried bread-crumbs, and 4.5 Gm. of glycerinated water are to be added.

Creosote.—Mr. Martindale considers powdered curd soap to be the best excipient. Equal parts are to be well mixed in a stoppered, wide-mouthed bottle and placed in a water-bath until they are combined. This, on cooling, forms a

* Adapted from "The Art of Dispensing," published by the Chemist and Druggist.

mass which can be combined with other ingredients, preferably in powder. A few shreds of yellow wax with a little powdered soap make good (though somewhat insoluble) pills. Powdered licorice may be used in place of soap. Light calcined magnesia (1 grain to 2 minims of creosote) mixed with creosote solidifies in a few hours, and can then be formed into pills, but is unadvisable owing to its insolubility. Always be careful about adding a chemical such as magnesia, owing to the changes which are liable. Powdered soap 1 part, powdered licorice root 5 parts, is a mixture 3 grains of which make a good mass with 1 minim of creosote. Animal soap is far better for massing pills than castile soap; e. g., creosote, grt. xij.; curd soap, dried and powdered, gr. vi.; phosphate of lime, q. s., make a good mass and a small pill, but with castile soap this would not be the case.

Croton Oil.—Powdered curd soap with a little glycerite of tragacanth does well with a prescription like one calling for 5 drops of croton oil with confection of rose, sufficient to make 4 pills.

Crystalline Salts, soluble in water, require a little care. They should be very finely powdered, and massed with thin conserve, adding, if necessary, a little tragacanth, or preferably with glycerite of tragacanth and a little inert powder. If silvered, they must be varnished with tolu and allowed to dry before using mucilage, or else silvered with the varnishing solution alone.

Bromide of Potassium..... 3 ss.
Sulphate of Iron..... 3 ss.
Extract of Nux Vomica..... gr. ijss.
Extract of Gentian..... q. s.

To make 15 pills.

In this formula double decomposition takes place between the two salts, the water of crystallization in the sulphate being liberated; consequently a very small quantity of extract suffices. Since bromide of iron is formed, the pills should be varnished and dispensed in a bottle.

Sulphate of Quinine..... gr. xxiv.
Dried Sulphate of Iron..... gr. xxiv.
Arsenate of Iron..... gr. ias.
Extract of Nux Vomica..... gr. vi.
Iodide of Iron..... gr. xlvij.

To make 24 pills, varnished with tolu.

This is likely to prove troublesome. Recently prepared iodide of iron should be powdered in a warm mortar, the other ingredients added, together with 5 grains of glycerite of tragacanth; the whole is to be vigorously worked together until it becomes plastic, rolled quickly, varnished, and inclosed in a bottle. Six or eight grains of extract of gentian also make a good mass.

Ergotin is variable in consistence but usually requires the addition of an inert vegetable powder to give it consistence. If there be more than two grains in each pill, it requires evaporation in order to keep the pills of reasonable size. The addition of about a twentieth part of tragacanth to each part of ergotin is an improvement.

Essential Oils.—The addition of wax or resin should be the last resort, but is sometimes unavoidable, as in the following case, where soap would be objectionable owing to the double decomposition between the ferrous sulphate and the soap:

Dried Sulphate of Iron..... gr. 1½.
Aqueous Extract of Aloes..... gr. i.
Oil of Savin..... m. i.

Make 144 such pills.

Melt 72 grains of yellow wax on a water-bath and add the oil, gently beating, if necessary, till they are thoroughly mixed. Mix the aloes and ferrous sulphate with 12 grains of powdered tragacanth. Pour upon this the oil and wax. Mix well and mass with a little glucose syrup. This makes a beautiful 4-grain pill.

Soap is generally all that is required to make a tractable mass. For example: powdered soap, 1 part; powdered licorice root, 5 parts. Three grains will make a good mass with 1 minim of an essential oil and a little water or alcohol. In a case like the following the licorice should, of course, be omitted:

Powd. Rhubarb..... gr. i.
Powd. Ginger..... gr. i.
Oil of Caraway..... m. i.

Rub the oil with one grain of powdered soap, add the powders, and mass with the smallest possible quantity of molasses.

When powders are resinous, as in compound extract of colocynth, compound pill of asafetida, aloes, etc., they should be triturated with the oil for a few minutes, the remaining ingredients, if any, added; then, if too hard, use alcohol, or, if too soft, sufficient licorice and soap.

A little solution of potash is often of great service in a mass containing much essential oil. Its use is, however, to be deprecated in the majority of cases.

Essential oils frequently form good excipients, as in the following examples;

Mass of Mercury..... gr. iv.
Powd. Comp. Ext. Colocynth..... gr. vi.
Resin of Podophyllum..... gr. i.
Oil of Anthemis..... m. i.

M.

Powd. Pill of Aloes and Iron..... 3 i.
Powd. Guaiacum Resin..... 3 i.
Oil of Savin..... m. i.

To make 24 pills.

Extract of Nux Vomica..... gr. i.
Creosote..... m. i.
Asafetida..... gr. ij.
Powd. Licorice..... gr. ij.

Extract of Hyoscyamus..... gr. i.
Powd. Comp. Pill of Colocynth..... gr. iv.
Oil of Caput..... m. i.

Extract of Cannabis Indica.—Licorice or lycopodium makes a good mass; failing which, compound tragacanth powder and carbonate of magnesium in equal parts may be tried.

Extract of Taraxacum.—The following was once dispensed:

Extract of Nux Vomica..... gr. ij.
Extract of Taraxacum..... gr. xij.
Aqueous Extract of Aloes..... gr. ij.
Extract of Hyoscyamus..... q. s.

To be made into 12 pills and silvered.

The pills split open after being silvered, even though varnished. The swelling was no doubt due to the taraxacum extract, which is commonly in a state of incipient decomposition, and silvered pills made with it frequently split. The best plan is to evaporate the extract almost to dryness and use a little tragacanth, as well as extract of hyoscyamus to make a mass. The mass should not be too hard, and the pills should stand half an hour before silvering.

Bromide of Iron.—The Société de Pharmacie de Paris recommends a hot, strong solution of the bromide to be mixed in a dry, warm porcelain mortar with licorice powder and gum arabic in equal parts, sufficient to make a mass. The pills should be rolled in lycopodium, or, better, sugar-coated, and preserved in a well-dried bottle.

Iodide of Iron.—Blancard's iodide of iron pills were formerly directed to be made as follows: Combine 4 Gm. of iodine with 2 Gm. of powdered iron in 8 Gm. of water; filter upon 5 Gm. of honey, evaporate to 10 Gm., and make into pills with marshmallow and licorice. A shorter and equally good process is to stir 2 Gm. of iron with 4 Gm. of iodine in 4 Gm. of distilled water in a porcelain mortar until the brown color has disappeared. Then add 4 Gm. of white sugar, 8 Gm. of marshmallow, and 7.5 Gm. of licorice. Make 100 pills, roll them in powdered soapstone, and dry in a warm place. Varnish with tolu.

Citrate of Iron and Quinine.—For this many excipients are used, and success with any of them depends greatly on habit. Good pills, which keep their shape and do not deliquesce, can be made by using resin cerate as an excipient. Alcohol makes a good mass, but quick rolling is essential.

Sulphate of Iron.—The granulated sulphate should be used for pills; it is generally free from adhering moisture, can be readily reduced to impalpable powder, and massed with glycerite of tragacanth with the addition of a little powdered sugar.

Dried Sulphate of Iron, as obtained from wholesale houses, is a very variable substance. Owing to overheating, it may contain basic sulphate of iron. Dispensers should, therefore, hesitate before using it in place of the undried in order to make a smaller pill. One peculiarity of pills made with dried sulphate is their liability to split

Sulphate of Quinine..... gr. xv.
Extract of Belladonna..... gr. x.
Dried Sulphate of Iron..... 3 i.

To be made into 30 pills.

This was made into a mass with 4 gr. of tragacanth and a little glycerin, but after about three weeks the pills cracked. A mixture of glycerin 1 part, and water 2 parts, makes a much better mass in this case, especially if a few grains of powdered acacia are used along with the tragacanth, and triturated with the iron salt before the other ingredients are added.

Blaud's (ferruginous) Pills.—The originals were made by heating together sulphate of iron and carbonate of potassium in honey, then adding other ingredients, and evaporating to a proper consistence. The combination is now presented at the dispensing counter in various forms, such as ferrous sulphate with carbonate of sodium or potassium. With these we shall deal presently. As exceptional forms we may note the following:

Sulphate of Iron..... gr. ij.
Bicarbonate of Potassium..... gr. ij.
Confection of Rose..... q. s.

Granulated Sulphate of Iron.....gr. ijss.
Bicarbonate of Sodium.....gr. ijss.
Glycerite of Tragacanth.....q. s.

Leaving the question of massing, it will be noticed that sulphate of iron with an alkaline carbonate or bicarbonate undergoes double decomposition, and in the latter case the freed carbonic-acid gas greatly affects the resulting mass. Either the salts must lie until all the gas is expelled (whereby the ferrous salt is much oxidized by exposure) and then massed, or the pills may be made at once with the consequence of being much larger than they should be, owing to the retained gas. It is advisable, therefore, in such cases as are above mentioned, to substitute a proportionate amount of the carbonate for the bicarbonate. It is also apparent that, owing to the liberation of water of crystallization, soft excipients, such as are directed above, are inadmissible.

Opinions regarding Blaud's pills are various. Whitla, for example, considers that when pills containing $2\frac{1}{2}$ gr. each of sulphate of iron and carbonate of potassium are prescribed, a mass should be made with petrolatum and cacao butter in order to avoid decomposition. Another writer advises that the salts be reduced to powder separately, then intimately mixed with a twelfth of their combined weight of tragacanth and massed with a twentieth of their weight of water.

Hager advises rubbing the iron salt in an iron mortar with the alkaline carbonate until a damp mass is formed, which is to be set aside for 15 to 20 minutes. Its consistence is then thin and muddy. To this are then added about $\frac{1}{4}$ of its weight of tragacanth and a few drops of glycerinated water, and the mass is again set aside for 10 minutes. If it is then at all crumbly, a few drops more of glycerinated water may be added, and a good mass will result.

Neither of these methods is advisable for the dispensing counter. Mix the salts, add $\frac{1}{4}$ of their weight of powdered tragacanth and the same amount of sugar, and mass quickly with the least water possible, about 5 minims sufficing for a dozen 5-grain pills. Note that equal proportions of the alkaline carbonate and ferrous sulphate give an excess of the alkali. Three parts of the former and 5 parts of the latter give better proportions.

Reduced Iron should be rubbed to a fine powder, a little licorice added, and a mass made with glycerite of tragacanth; or manna alone may be used. When combined with vegetable extracts containing, as most do, some acid ingredients, the addition of moisture, according to Hager, occasions development of hydrogen and combination of the iron, with liability of the pills to swelling. Of course the extracts should not be acid.

Guaiacate of Lithium.—Powder finely and use alcohol, η viij. to each 3i. A soft mass should be made, and the use of slight warmth is advantageous.

Mercury with Chalk must not be vigorously worked in a pill mortar, or the mercury separates. Thin conserve or a soft extract forms a good excipient. With powders, or pill masses which can be used in powder, gray powder should be carefully triturated with such ingredients first to avoid the chance of mercury separating.

Insoluble Salts, or such as are nearly insoluble in water and are devoid of adhesive property (such as oxy-salts of bismuth, oxalate of cerium, etc.), are best massed with glycerite of tragacanth, although equal parts of acacia, tragacanth, and syrup sometimes give more adhesiveness and excellent results.

Lupulin and Camphor are not readily made into a plastic mass with the usual excipients without considerably increasing the size of the pills, but either alone, if very sparingly used, yields a good mass.

Ox-Gall forms good pills with equal parts of tragacanth and acacia. It may be had dried and powdered, and in this state it is very convenient and forms a good mass with concentrated compound decoction of aloes.

Pepsin.—Make a soft mass with a mixture of equal parts of glycerin, syrup, and water, and roll quickly. One minim of dilute hydrochloric acid makes a very good mass with 5 grains of pepsin.

Phosphorus.—A mass made with balsam of tolu is recommended; but it is said that the balsam must be washed to separate several bodies lighter than water and such contaminations as cinnamic and benzoic acids. Moreover, the resinous matter is thus saturated with as much water as it will retain. A mass is made with 40 grains of phosphorus and 960 grains of washed balsam by placing them in an enamelled iron basin capable of holding 40 oz. and containing about 20 oz. of water. Heat the basin on a water-bath, and, when the ingredients are melted, stir with a glass rod until particles of phosphorus can no longer be seen, taking care that the ingredients are not brought above the surface of the water. After fifteen minutes' continuous stirring, remove the basin and place it under a stream of cold water. When cool, mix it further under the water with the hands for a short time, and finally place it, under water, in earthenware jars. One grain of this mass contains $\frac{1}{4}$ grain of phosphorus, and the mass may be combined with any ingredients.

Phosphorus pills made with cacao butter dissolve so

readily as to cause unpleasant eructations, but a smaller dose of this mass appears to be more effective.

The following formula by Allen & Hanbury is a favorite one with many pharmacists:

Phosphorus.....gr. ij.
Bisulphide of Carbon... ..m. x. or q. s.
Dissolve.

Powdered Hard Soap.....gr. xxxv.
Powdered Guaiacum Resin.....gr. xxxv.
Glycerin.....gtt. xij.
Powdered Licorice Root.....gr. xij. or q. s.

Make a mass of 100 grains. To be divided into pills of the strength required, and varnished or coated in the ordinary way.

The mass is of good consistence; is easily manipulated, and readily soluble. A drop of oil of cloves added to the carbon bisulphide is said by Mr. Proctor to lessen its tendency to inflame.

The bisulphide-of-carbon method is most expeditious for the dispensing counter. Rub up some licorice powder ($\frac{1}{4}$ to 1 grain for each pill) with half its weight of water, pour on the bisulphide solution, stir well and without pressure, and make into a mass with compound tragacanth powder. The water effectually prevents oxidation of the phosphorus, and the bisulphide is dissipated in massing.

This method is also suitable in such a case as the following:

Sulphate of Quinine... ..gr. $\frac{1}{2}$
Extract of Nux Vomica.....gr. $\frac{1}{2}$
Phosphorus.... ..gr. $\frac{1}{2}$

If you have to make, say, 33 pills, rub the quinine and extract together with 15 grains of powdered licorice and 5 drops of water. Now dissolve the phosphorus in 5 or 6 drops of bisulphide of carbon in a small test-tube; mix with the other ingredients, and mass quickly with glycerite of tragacanth.

Phosphorus pills should always be varnished or coated with a solution of wax in ether (1 in 7), and finished off with powdered soapstone.

Pill of Aloes and Myrrh.—The best excipient is a mixture of glycerin 1 part, and molasses 3 parts.

Compound Pill of Colocynth, when made with resin of scammony, invariably flattens. This may be prevented to some extent by adding 10 to 20 drops of solution of potassa to each ounce of mass, or by substituting soap for the sulphate of potassium. The addition of a fibrous powder, such as licorice, gives durability to the mass. Pill of colocynth with hyoscyamus requires only the extract to mass it.

Mercurial Pill, when prescribed with a soft extract, should, if possible, have the extract first dried or powdered. Compound pill of calomel, with pill masses having an aqueous excipient, invariably forms a crumbly combination, which is remedied by using the former in powder—i. e., by omitting the castor oil.

Iodide of Potassium may be made into pills, according to Whitla, by rubbing the salt with a few drops of water into a stiff, smooth paste, and massing with a little powdered licorice. In this way 6 grains may easily be got into a fair-sized pill. Tragacanth and water alone make a good mass. A pill containing this iodide and a considerable quantity of extract of colchicum was ordered, and, although carefully dried extract was used, the mass was too soft. As the pills were not required till next day, they were placed under a jar with sulphuric acid, which succeeded in extracting the excess of moisture.

Permanganate of Potassium.—Obviously no substance which is readily oxidized, such as extract of gentian, glycerite of tragacanth, among common excipients, should be used. The excipient must be a substance which is practically unoxidizable, and such we have in various fats and earths. For example, resin cerate 1 part, and permanganate of potassium 4 parts, make a good mass, but if kept for some time it dissolves with great difficulty. Neither petrolatum nor petrolatum and paraffin give sufficient firmness, but the addition of kaolin (white potter's clay) renders it of proper consistence. Equal parts of petrolatum, paraffin, and kaolin may be kept on hand as an excipient, and may be made by melting the former two and sifting in the powdered kaolin, with constant stirring until the mixture is cool. A very good mass is made with kaolin and water, or fuller's earth and water; 18 grains of fuller's earth and 12 grains of the permanganate forming a mass with very little water. The best coating for such pills is a solution of white paraffin in benzin, afterwards finishing off with French chalk. The following formula has to be treated on the principles above laid down:

Permanganate of Potassium,
Oxide of Iron.... ..aa 3i.
Muriate of Cinchonidine 3 iss

To be made into 48 pills and silvered.

Make a mixture of paraffin and petrolatum, of each a half-drachm; to this add the cinchonidine in fine powder,

then add the permanganate and the oxide of iron, also in fine powder, and stiffen with a little powdered kaolin, if necessary.

Quinine Sulphate.—The simplest excipient is glycerite of tragacanth; or five percent of tragacanth, well mixed, forms a good mass with simple syrup. A little glycerin may be added if the pills are to be kept long. The use of extract of gentian or other dark-colored excipient is objectionable. Sulphuric acid is now extensively used as an excipient, 1 drop of the aromatic sulphuric acid being sufficient for 4 grains of quinine. Mass quickly and roll in powdered soapstone or fine, sifted arrow-root. An excellent mass is made with tartaric acid and a little water and glycerin. For 12 five-grain pills take 6 grains of tartaric acid, and rub it with the quinine until it becomes crumbly, then add 2 drops each of glycerin and water and mass quickly. An objection to tartaric acid is that it alters the chemical constitution of the quinine salt, sulpho-tartrate being formed. Its therapeutic value is, however, the same.

The judgment of the dispenser must be used in unusual cases, as, for example:

Sulphate of Quinine.....gr. iss.
Tar.....gr. iij.

In this case an inert powder, such as lycopodium or licorice, adds too greatly to the bulk of the pill. If melted with a fifth of its weight of wax, the tar becomes more tractable and masses well with calcium phosphate.

Resinous Ingredients in Pills.—Gum resins and resins must first be rubbed to a fine powder, and, to prevent sticking to the mortar, it and the pestle may first be rubbed with paper soaked with almond oil. The resinous powder is easily made into a mass with a few drops of alcohol, but pills so made do not keep their shape. To most of such substances, and to aloes especially, the addition of a little vegetable powder or scraped blotting-paper is desirable. Asafoetida gives pills of good consistence with a few drops of weak alcohol; but such an addition with aloes produces pills which flatten. Alcohol should be added cautiously, as it is often found, especially when soap is present, that the mass becomes softer as it is worked. Mucilage of acacia is a much safer excipient than alcohol. If alcohol is used, the main thing to be observed is to do so sparingly. The mass, for example, should not be made as soft as those made with ordinary excipients, but should, on the contrary, be so hard as to require some degree of pressure in rolling. If this precaution be observed, the pills will not lose shape. When, however, the pills are to be kept for some time, a less drying excipient should be used.

Powdered Rhubarb.—Use diluted alcohol or tincture of rhubarb (1 minim to 3 grains). A soft mass should be made and rolled quickly, otherwise it is troublesome. If more than 24 pills be attempted at once, the mass assumes a leathery consistence and will have to be thrown away.

Powd. Rhubarb.....3 i.
Powd. Curd Soap.....3 i.
Powd. Ipecac.....gr. vi.

To be made into 24 pills.

This makes a good mass with 25 minims of tincture of rhubarb.

Rhubarb is one of many substances for which each experienced dispenser has his own excipient, as may be inferred from the following examples from various sources:

- (1) Simple syrup is better than either alcohol or water for massing powdered rhubarb.
- (2) Use a mixture of equal parts of glycerin and tincture of rhubarb (1 minim to 3 grains).
- (3) For powdered rhubarb, a mixture of 2 parts of glycerin with one part of alcohol answers well.
- (4) Powdered rhubarb makes a good mass with one-fifth its weight of glycerin.
- (5) Molasses is the most valuable excipient for powdered rhubarb.

Bicarbonate of Sodium, 3 grains, with 1 grain of powdered ginger, can be made into a very workable mass by the addition of 1 grain of tragacanth, and water or glycerin sufficient to make a mass. The pills both roll well and keep well.

Sulphide of Calcium (sulphurated lime) should be mixed with an equal quantity of sugar-of-milk, and, after careful trituration, as much powdered, decorticated licorice root added as will make the weight about 1 grain for each pill. The mass can then be easily made with glycerite of tragacanth.

Tannic Acid, if made into pills with mucilage, will crack, crumble, and fall to powder as soon as the pills are dry. A mixture of glycerin with the mucilage makes an excellent excipient.

Valerianate of Zinc.—Add a small quantity of acacia, and mass with alcohol. This gives a mass requiring quick manipulation, but yielding excellent results. Glycerite of tragacanth also makes a good mass with the addition of a little inert vegetable powder.

(To be continued.)

Notes on Commercial Drugs, Chemicals, and Essential Oils.

[From the April Reports of the firms of Gehe & Co., of Dresden, and Schimmel & Co., of Leipzig.]

Adonidin.—This glucoside continues to be in considerable demand in Southern Europe, though it is much less used in Germany. According to Podwyssotzki, the real, active principle of *Adonis vernalis* is a bitter substance, called by him *picroadonidin*. This is a glucoside, amorphous, soluble in water, alcohol, and ether, of very bitter taste, and has hitherto formed, more or less, a constituent of the commercial adonidin.

Aluminium.—As previously announced, the aluminium factory at Oldburg, near Birmingham, turns out daily about 500 pounds of aluminium (cost about 16 shillings per pound). Although this is a very notable quantity, yet the price is still an objection to its more universal introduction.

Antifebrin, or acetanilide, maintains its place among antipyretics, and has rather increased in consumption than diminished. Gehe & Co. estimate the quantity at present consumed at three times that of antipyrin.

Amyl Nitrite.—In place of the usually employed amyl nitrite, prepared from commercial amylic alcohol, which is itself a compound of various isomers, Messrs. Bals and Broglie have recommended the use of the nitrite prepared from the true tertiary amylic alcohol. This has to be prepared from amylene hydrate, and in consequence thereof commands a very high price.

Antipyrin.—In spite of the rivalry of antifebrin, the consumption of antipyrin has become a very large one. Its value depends not only upon its multifarious effects, among which its antipyretic use is almost overshadowed, but also upon its general innocuousness, and last, but not least, upon its ready solubility in water, which permits its employment in the most varied forms.

Anthraxarobin.—The factory which had been engaged in the preparation of this artificial substitute for chrysarobin discontinued its manufacture for some time, owing to a cessation of demand. It may be judged from this that the substance has not been found to possess sufficiently remarkable advantages over chrysarobin.

Atropine and Atropine Sulphate.—The sulphate of atropine, hitherto known as such in commerce, and prepared by various methods from belladonna root, has always been a mixture of so-called "light" and "heavy" atropine (sulphate). According as more or less alkali, or a longer or shorter contact of the latter, had prevailed during the manufacture of the alkaloid from the root, the more evanescent or the more stable form of the alkaloid (hyoscyamine or atropine) prevailed in the product.

Accordingly, also, the respective melting points of the gold salts vary. (The pure atropine gold salt melts at 136° to 138° C., and the pure hyoscyamine gold salt at 159° C.)

Even before Prof. Schmidt showed how hyoscyamine could be converted into atropine by heating it beyond its melting point, and also before the observations of Will (see this journal, 1888, p. 141) were made public, the free alkaloid atropine was known under two forms, viz.: 1. "Heavy" (melting at 115° C.); and 2. "Light" (melting at 108° C.), and it was easy to separate these during the manufacture. All pharmacopœias, with the exception of the recent Japanese Pharmacopœia, restricted themselves to a general characterization of the salt usually sold as sulphate of atropine, which consisted of varying proportions of the "heavy" and "light" alkaloid. The Japanese Pharmacopœia has made a new departure, and recognizes only the sulphate prepared from the "heavy" alkaloid. Though it does not state the melting point of the double salt with gold, yet the whole description shows that this variety is meant. Gehe & Co. announce that they will in the future offer for sale both the light and the heavy alkaloid, and the sulphates prepared from both, so that purchasers may choose just what they want. The unchanged, light alkaloid, extracted from belladonna (otherwise known as hyoscyamine), will be designated in trade as "Atropinum naturale" (melting at 106–108° C.); and the altered, heavy alkaloid, produced during the manufacture from the former, will be designated "Atropinum verum" (melting at 114–115° C.).

Experiments so far made with both alkaloids have shown them to act precisely alike, at least when used upon the eye. Regarding their action when taken internally, further trials are in progress.

Bismuth Peptonate.—This salt has a moderate circle of devotees, who use it with preference in cases of dyspepsia. A good quality of this compound should not have a dark color or a disagreeable odor.

Camphoric Acid, though not a new remedy, yet may be said to have been re-introduced recently, and is in considerable demand, being used internally, in doses of 15 to 30 grains, as a remedy for the night-sweats of consumptives. It is also used in diseases of the respiratory organs, in 1-per-cent alkaline solution, administered by inhalation.

Carbolic Acid.—This article has continued to be in lively demand. It appears that constantly increasing quantities of it are absorbed by manufacturers of picric acid for the use of high explosives in the interest of certain govern-

ments. The complaints about development of a red color in the acid have become less frequent, but have not altogether ceased. Lately it has been suggested that the red color is caused by traces of tarry coloring matters which assume a red tint on exposure to air. This theory seems to be supported by the fact that, when a vessel containing such reddened acid is dipped into hot water until the external layer is melted, and the liquid then poured off, the interior, still unmelted mass is entirely colorless.

Codeine.—Owing to the successful synthetic preparation of this alkaloid, its price has become quite stable, being about 2½ times that of muriate of morphine. It is curious that scarcely any attention is paid to the very easily soluble phosphate of codeine, while the much less soluble alkaloid continues to be in chief demand.

Caffeine.—It seems that the continental factories find it gradually necessary to discontinue the manufacture of caffeine, since English manufacturers, by reason of better advantages in obtaining the raw material (and freed from duty besides), are now able to undersell other makers.

Cotoin and true Coto Bark.—Genuine coto bark has for a long time been absent from the market. As no true cotoin could be prepared, the demand for it has almost ceased, para-cotoin (and para-coto bark) being used in place of it. Recently, however, an invoice of really genuine coto bark has reached Europe, but is held at an exorbitant price.

Ergotinine.—This alkaloid is being more largely used. It is administered hypodermically, best in form of the following solution:

Ergotinine 1½ grains.
Lactic Acid 8 grains.
Distilled Water..... 3½ fl. oz.

Dose, hypodermically, 4 to 10 minims.

Ferri Lactas.—While this form of iron is in but slight demand in this country, it appears to be one of the most popular iron preparations in Germany.

Creosote.—Since the beneficial effects of creosote in phthisis have been more thoroughly recognized, its consumption has very much increased.

Since one of the constituents of creosote, viz., guajacol, has recently been recommended and used for the same purposes as creosote itself, there is a danger that creosote from which guajacol has been extracted ["deguajacolized creosote"] will be sold in the market. It is therefore quite proper that the pharmacopoeial description and tests should be so modified as to take account of this. Among the proposed requirements are: a spec. grav. of 1.070, the formation of a difficultly soluble potassium salt upon the addition of caustic potassa, and the benzin test.

Eucalyptol.—The pure substance has a spec. grav. of 0.930, crystallizes at 0° C., and boils at 176–177° C.

Eucalyptol is a widely distributed principle. It has, so far, been discovered in the following oils:

Oils of	Source.	Discoverer.
Wormseed...	Artemisia Cina	Wallach & Brass.
Cajuput	Melaleuca Leucadendron	Wallach.
Eucalyptus ..	E. globulus.....	Jahns.
"	" amygdalina.....	Wallach & Gildemeister.
"	" Bayleyana.....	Schimmel & Co.
"	" microcorys.....	Schimmel & Co.
Rosemary...	Rosmarinus officinalis ..	Weber.
Spike.....	Lavandula Spica.....	Voiry.
Cheken	Myrtus Cheken	Weiss.
Myrtle.....	Myrtus communis.....	Jahns.
Camphor.....	Laurus Camphora.....	Schimmel & Co.

Hydroxylamine.—This substance, in form of hydrochlorate, is being successfully used as a substitute for chrysarobin, pyrogallie acid, anthrarobin, etc. It is commonly used in solution, in alcohol and glycerin, of the strength of 1 in 1,000 to 1 in 500.

Hyoscine.—The considerably reduced price of hyoscine will no doubt help its more rapid introduction as a sedative and hypnotic. Professor Kny, of Strassburg, has used the alkaloid in 3,000 cases among maniacal patients, and obtained from doses of ¼ to 1 Mg. (¼ to ¼ of a grain), in 83 cases out of 100, a quiet sleep lasting 6 to 8 hours.

Iodine.—According to an agreement between the producers, the export of iodine from Iquique (Chili) to England, Germany, and United States was reduced from 175,680 kilos in 1886, to 77,196 kilos in 1887.

Myrtol.—The consumption of this proximate principle, recommended by Linarix as an antiseptic, has materially increased. Eichhorst used it in doses of 0.15 Gm. (2½ grains) repeated several times daily, as a disinfectant of the air-passages, with considerable success. According to Jahns, myrtol consists mainly of cineol. For this reason he recommends eucalyptol in place of myrtol, since the former consists likewise, in the main, of cineol.

Regarding myrtol, we take a few interesting notes from Schimmel & Co.'s report:

The first experiments (of Linarix and Delieux de Savignac, regarding the antiseptic action of myrtol) were made with oil of myrtle (from *Myrtus communis*); later on, however, myrtol was used, which is that portion of the oil which boils between 160 and 170° C. Hitherto the composi-

tion of this substance has been unknown. A recent investigation has shown the following results:

Oil of myrtle has a spec. grav. of 0.910 at 16° C., and is dextrogyre. Subjected to fractional distillation, the oil began to boil at 160° C. The distillate was caught in fractions from 10 to 10° C., and up to 240° C. about 80 per cent of the oil passed over. The residue consisted of partly resinified terpenes. The first fraction passes over at 158°–160° C., and is a dextrogyre terpen (C₁₀H₁₆) which is probably "dextrorotatory pinen."

The next fraction contains cineol (boiling at 176° C.). Besides these, there appears to be present a small amount of a camphor, which could, however, not be obtained in a pure state.

In its general character oil of myrtle agrees with that distilled from *Myrtus Cheken*, and is also related to oil of *Eucalyptus globulus*.

The so-called myrtol is a mixture of dextrogyre pinen and cineol, and should more properly be called "rectified oil of myrtle."

Jahns expresses the belief that the antiseptic action of myrtol is solely due to the cineol it contains. If this is so, there will be no danger of any scarcity of material. On the other hand, it would be impossible to procure the requisite quantities of myrtol.

Narceine.—The patented method of artificial preparation of narceine (by causing narcotine-methyl-chloride to act upon solution of caustic soda, and then warming with water) is likely to cause a decline in the price of this alkaloid.

Picrotoxin has been declared by Bokai to be a specific antidote for morphine, and may be used in place of atropine. He also thinks that it may, in many cases, be employed in place of the alkaloids of nux vomica.

Platinum.—The consumption of this metal has been nearly doubled during the last few years. Of course the price has also advanced. The principal consumers are Russia and the United States. In the latter, there are consumers requiring about 50 kilos (107 lbs.) every month. [We believe that a large portion of this is absorbed by manufacturers of electrical apparatus, another large portion by chemical factories, and the rest for small chemical apparatus and reagents.—Ed. AM. DR.]

Oil of Anise.—To correct a misstatement or error made by some English writers (in *Pharm. Journ.*, to which we have already alluded in a previous issue) regarding the relative quantity of oil of star anise and oil of Pimpinella anisum, Messrs. Schimmel & Co. state that they work up, under normal conditions, about 7,000 kilos of anise seed daily. From October, 1887, to May, 1888, they worked up 800,000 kilos, obtaining therefrom 24,000 kilos of oil of anise. [In this country it is, however, well known that when "oil of anise," without further specification, is ordered from a dealer, the oil of star anise is usually supplied.—Ed. AM. DR.]

Oil of Bay.—Bay rum, for many years one of the most popular toilet articles in this country, had been but little used in Europe until a few years ago. It has, however, at last captured the favor of the European public, and both the genuine and imitations are in vogue. The manufacturers of and dealers in oil of bay of course supply their customers with recipes for making artificial bay rum. Some of these are very good; others are, to say the least, of doubtful character. In their last report, Schimmel & Co. quote two recipes from "Hamlin's Formulae," the first of which may be acceptable, while the second appears to us to be rather eccentric:

I.

Oil of Bay 2 drachms.
Oil of Pimenta..... 1 drachm.
Oil of Cloves.. 10 drops.
Alcohol..... ½ gallon.
Water..... ½ "

Mix, allow to stand several days, and filter.

II.

Oil of Bay..... 1 oz.
Alcohol..... ½ gallon.
Jamaica Rum, best..... 1 "

Mix the oil and alcohol, allow to stand two weeks, then add the rum.

Oil of Cedarwood.—It may be of interest to microscopists that Schimmel & Co. have succeeded in preparing an inspissated oil of cedarwood which relieves the user from the disagreeable task of concentrating the commercial oil himself. It has about the consistence of castor oil and a light Rhine-wine color. It has been so far impossible to obtain it colorless.

Oil of Bergamot.—The question of what should be the natural color of oil of bergamot has, of late, been repeatedly a subject of discussion. Schimmel & Co. have obtained on this subject reports from two of the most trustworthy manufacturers in Reggio.

One of these states that the freshly prepared oil has a brownish-yellow color. A certain proportion of it, indeed, has a greenish tint, but this is the case only when the oil is prepared from unripe fruit. This is seldom put on the market, but is usually mixed with that which is prepared from ripe fruit. If this "greenish" variety is examined in a glass tube, its tint is more properly called "yellow-

ish." The emerald-green oil exported from Messina derives its tint from badly tinned copper vessels (estagnons).

The other manufacturer states that the freshly prepared oil of bergamot has the color of honey, and that this kind is preferred by purchasers. A green color is produced when the oil is kept for some time (seven or eight months) in tinned copper vessels. It gradually corrodes the tinning, and then absorbs copper.

Oil of Orris.—It is well known that the largest portion of this substance, as now put on the market, consists of myristic acid carried over by distillation, and this holds the aromatic oil. Schimmel & Co. announce that they will eventually also put the pure oil among their products. But this will be a very expensive article, the price or cost of which will likely be equal to an equal weight of gold.

Oil of Peppermint.—According to carefully collected statistics, Schimmel & Co. estimate the production of oil of peppermint in all countries during the year 1888 to have been as follows:

United States, New York.....	ab.	35,000	kilos.
" " Michigan.....	"	27,000	"
England, Mitcham.....	"	5,000	"
" " Cambridge and Lincolnshire, "	"	1,400	"
Japan.....	"	64,000	"
Italy.....	"	1,200	"
France.....	"	4,600	"
Germany.....	"	400	"
Russia.....	"	?	"

Total, about..... 138,000

Oil of Rose.—Schimmel & Co. give some valuable information regarding the constituents and properties of genuine oil of rose, and the best methods of detecting adulterations:

I. Isolation and Determination of the Stearopten.

Warm 50 Gm. of the oil with 500 Gm. of 75 per cent alcohol to a temperature between 70 and 80° C. On cooling to 0° C., the stearopten is almost completely separated. Remove it from the liquid portion, treat it with 200 Gm. of 75 per cent alcohol, and continue to repeat this until the stearopten is completely odorless. Two treatments of the crude stearopten are usually sufficient.

Schimmel & Co. found, in this manner, the following quantities of stearopten:

1. Rose Oil, German, 1887:	32½	per cent.
2. " " " 1888:	34	"
3. " " Turkish, 1887:	12-13	"
4. " " " 1888:	14	"

II. Determination of Spermaceti (if present) in the Stearopten.

Boil 3-5 Gm. of the stearopten during 5 or 6 hours, with 20-25 Gm. of alcoholic solution of potassa (5 per cent), under an upright condenser, evaporate the alcohol, and add hot water to the residue. On cooling, the larger portion of the stearopten will separate and float upon the surface as a firm, crystalline mass. Pour off the alkaline liquid, wash the stearopten with a little cold water, then melt it in hot water, allow to cool again, pour off the liquid, and continue melting and washing until the wash-water is neutral. Unite the aqueous liquids, and agitate it twice with ether in order to extract any stearopten suspended in it. Separate the alkaline liquid from the ether, acidulate it with dilute sulphuric acid, and again agitate it with ether. On evaporating this, it should leave no residue (abs. of fatty acids). By way of control, the stearopten, dried at 90° C., may be weighed, including in it, of course, also that portion which had been shaken out by ether from the alkaline liquid. The quantity found will always be a trifle short, since a small amount volatilizes on drying. The loss was found to be about 1 per cent.

To verify the accuracy of this test, 57 Gm. of Turkish oil of rose (1888) were purposely adulterated with 1 Gm. of spermaceti, and the product treated by the before-mentioned process. The 58 Gm. of mixture yielded 9.55 Gm. of stearopten — 16 per cent; 3.07 Gm. of this stearopten yielded 2.89 Gm. of recovered stearopten and cetylic alcohol. Loss 0.18 Gm. The amount of fatty acids obtained was 0.155 Gm., corresponding to 0.291 Gm. of spermaceti. The original mixture contained 1.7 per cent of the adulterant, and 1.5 per cent was discovered by the test.

Following are the melting points of rose-oil stearopten:

From German Oil, 1887:	36-36.5°
" " " 1888:	35-35.5°
" " Turkish, 1887:	34-35°
" " " 1888:	33.5-34°
" " " 1888:	31.5-32°
with addition of 1.7 per cent of spermaceti	

Rose oil thus deprived of its stearopten (or nearly all of it) remains liquid when cooled to 0° C. At a lower temperature, however, it becomes gelatinous, owing to the fact that it still contains some stearopten.

The fluid portion of rose oil has a most exquisite, powerful odor. When dissolved in alcohol it does not yield the disagreeable crystalline flakes so annoying when preparing perfumes. For these reasons Schimmel & Co. have

introduced the purified oil (free from the odorless stearopten) on the market.

Oxyaphthoic Acid has been occasionally employed as an antiseptic, in form of one-per-cent solution in colloidion, and as 1 per cent cotton. In veterinary practice it has been successfully used against scabies.

Petrolatum and Vaseline.—The German manufacturers of vaseline have petitioned Government to permit the duty-free importation of foreign material for the manufacture of petroleum ointment (vaseline, petrolatum, etc.), since the present duty makes it difficult for the German manufacturers to compete with foreign ones. [If this petition is granted, which is not improbable, the export of petroleum ointment from this country will no doubt suffer a considerable reduction.—Ed. A.M. Dr.]

Strophanthus.—The seeds are still in good demand. There were new arrivals of *Strophanthus Kombé*, which has a greenish hairy appendage, and is the variety of species upon which the recorded therapeutic effects are really based. The brownish-haired seeds of *S. hispidus*, of which there are also invoices in the market, do not seem to be able to find purchasers.

Sulphonal.—This hypnotic is being consumed in very considerable and increasing amount. It seems destined to displace paraldehyde, amylene hydrate, etc., and is likely even to make inroads upon the consumption of morphine and chloral. Nevertheless, as long as the price is kept high, its use is likely to be restricted to those persons who are better able to afford its purchase, particularly as it takes at least fifteen grains to produce sleep.

Gehe & Co. think that the reported negative results (which are stated to amount to about ten per cent of all cases) will be materially reduced in number if the remedy is administered in the form of powder.

Thiol.—Thiol (Latinized: Thiolium) has made its appearance as a rival of ichthyol. It is produced, after a patented process, from coal-tar (obtained from brown coal or lignite) by treatment with sulphur and sulphuric acid.

Mercury Mines.

THE quicksilver mine at Almaden, in Spain, is said to have been discovered 400 years B.C. For twenty-two centuries it has been in course of development, always paying a profit, though its production previous to the fifteenth century was comparatively small. Up to that time mercury was principally used for the making of vermilion, but in 1557 its property of amalgamating with the precious metals was discovered, and this created a largely increased demand. The Almaden mine is the most perfect deposit of cinnabar, or perhaps of any other metal, ever discovered; consisting of three parallel veins about 100 feet equidistant, penetrating the earth almost perpendicularly, growing richer and wider in metal as they descend, the deposit at 1,000 feet depth being richer than at any point above. For the last twelve years the average yield of mercury in the ore has been 9 per cent, for the last two years 10.50 per cent. The Idria mine, in southern Austria, was discovered at the close of the fifteenth century. Next to the Almaden, this is the richest mine now worked, the bottom of the lode showing no diminution either in the quantity or quality of yield. Its reserves of ore are estimated to be equal to 900,000 flasks. The New Almaden mine in America is situated about thirteen miles from San José, California, at an elevation of 1,700 feet above the sea, in a low range of hills. The quicksilver deposits of California are characterized by a great and persistent irregularity, so that it makes the mining of these ores much more difficult than that of other metals. It has often occurred in the history of the mine that there was no ore in sight, and it looked as though the works must be shut down, and it has only been by the most careful prospecting that it has been possible to keep up the production. Very frequently large bodies of ore will almost completely run out, and there will be visible in the face of the works only a slight coloration in the vein matter which indicates that there is any more left in that particular place, and by following out this little string of ore very carefully it may lead into a large deposit. From the commencement of the working of this mine up to 1870 the results were very unsatisfactory, and in the year named it seemed as if the company, which had in the meantime contracted an indebtedness of about £300,000, would collapse, but by a supreme effort another £40,000 was raised, and the expenditure of this led to the discovery of paying deposits.—*Chem. and Drugg.*

Bisulphide of Carbon as an Internal Remedy.—Bisulphide of carbon has been used with apparent advantage in typhoid fever, and has been recommended in diphtheria and other diseases in which micro-organisms occur. Cases of acute and chronic dysentery, of atonic dyspepsia, of simple gastric ulcer, and of typhoid fever have also been treated successfully with it. The dose given was generally about 2 oz. of a saturated solution of the bisulphide in water mixed with milk or a little syrup, taken half an hour or so before meals. In typhoid, enemata of a pint of water, containing about ½ drachm of the bisulphide, were given in addition to the internal administration of iodide of potassium and kairin. The diarrhoea diminished, and the patient made a good recovery.

Notes on New Remedies.

Hydrocinnamic Acid (Acidum hydrocinnamicum).

Synonyms: homo-toluic, or benzyl-acetic, or beta-phenyl-propionic acid. $C_9H_9O_2 (=C_6H_5.CH_2.CH_2.COOH)$.

Acicular, reddish-white crystals, but slightly soluble in water, soluble in 6 parts of alcohol. The alcoholic solution has a pleasant acidulous taste and an aromatic odor which diffuses itself through the surrounding atmosphere.

Drs. Klein and Lingard report that they have used this substance with success in the destruction of the *bacillus tuberculosis*. Dr. Williams subsequently also tried the remedy in *alcoholic solution*, beginning with a dose of 10 minims in an ounce of water, increasing generally to 20 minims in 2 oz. These doses were given two or three times daily. Thirteen out of 20 phthisical patients, treated with the remedy from 28 to 85 days, manifested a decided improvement (*Practitioner*, 1889, Feb., p. 100).

The acid seems to act not so much on the tubercular process as upon the purulent process. No increase of expectoration or cough took place in any case.

Colchicine.—Darier recommends this alkaloid in marginal ulceration of the cornea when of *gouty* origin; also in several other affections of the eye. [We mention this chiefly on account of the caution necessary in administering the remedy, colchicine being a dangerous drug.] Darier orders pills containing $\frac{1}{4}$ grain of colchicine each, of which he administers daily 1 or 2 or 4, never over 6. The dosing is to be reduced (but not entirely suspended) whenever colic or gastric spasms occur. The treatment must be continued in unbroken sequence.

Mercury-Betanaphthol Acetate.—This has been recommended by Bombelon as an excellent substitute for corrosive sublimate and for iodoform in the dressing of wounds.

It is an amorphous, rather heavy, white powder, insoluble in the usual menstrua. It is applied in form of highly diluted powder:

Mercury-Betanaphthol Acetate..... 1 part.
Kieselguhr..... enough to make 200 parts.

[Kieselguhr is a fossil siliceous earth, found in Europe and in this country, used, among other purposes, for absorbing nitroglycerin in making dynamite. The so-called "electro-silicon," used as a polishing material, is a very pure form of kieselguhr.—ED. AM. DR.]

Or gauze is impregnated with it. Or it is triturated with fresh albumen, and the mixture shaken with water, so as to produce an emulsion.

The remedy is also recommended internally, in syphilis and in abdominal typhus, in doses of $\frac{1}{4}$ grain several times daily.

Morrhual [of which we had occasion to speak several times before] is now easily available in the market, and is highly spoken of as an "extract of cod-liver oil," "forming the most eligible substitute" for the latter. Lafarge and Germain-Sée report favorably on it from the experiments in the Paris hospitals.

Morrhual appears as a brownish-yellow, oily liquid, from which, at ordinary temperatures, a portion crystallizes out. Its odor resembles the oil itself. Hence it is best given in gelatin capsules containing about 3 grains of morrhual each. This corresponds to about $1\frac{1}{4}$ fluidrachms of the oil itself.—Chiefly after *Merck's Bulletin*, April, 1889.

Thiol.

THE success of ichthyol in the treatment of rheumatism and certain skin diseases has encouraged researches to synthetically obtain a substance identical with it in composition and action. After laborious preparatory work, Dr. Jacobsen has succeeded in obtaining such a product, which he calls thiol, from "theion" (sulphur). He found that while saturated hydrocarbons do not take up sulphur, considerable quantities of this substance may be added to non-saturated hydrocarbons. On this circumstance he bases his patented process, according to which so-called gas-oil is heated in an oil-bath to a temperature of $215^{\circ} C.$, 10 per cent of flowers of sulphur being gradually added meanwhile. This process yields a crude thiol oil, which has now to undergo sulphurization, effected by the addition of an equal quantity of pure concentrated cold sulphuric acid. The result is thiol-sulphuric acid, which is identical with ichthyol. It forms compounds with soda and ammonia, equal in every respect to the salts of ichthyol. It is claimed that thiol compares favorably with ichthyol in being inodorous, easily pulverized, and cheaper. Its therapeutic action has been studied by Drs. Reeps and Buzzi, both of Berlin. They declare it to have the same therapeutic effects as ichthyol. Thiol is a dark-brown fluid of syrupy consistency, and is also to be obtained in the shape of a fine powder, prepared from the fluid by evaporation. Thiol may be dispensed as an ointment in combination with vaseline (3 i.), lanolin (3 i.), with thiol 3 i.; to make a dusting-powder, 1 drachm of thiol may be combined with 2 drachms of oxide of zinc, 1 drachm of powdered starch, and 2 oz. French chalk. For internal administration the dried thiol is combined as a pill with licorice powder and glycerin of tragacanth. The dose is about 2 grains.—*Chem. and Drugg.*

American Ozokerite.

A COMPANY has been formed, under the laws of New York State, to develop large deposits of ozokerite, a natural paraffin wax existing in the Wasatch Mountains of Utah Territory, about 113 miles east of Salt Lake City. These mines are said to contain the only deposits of this mineral known to exist outside of Galicia, Austria, whence the entire world's supply of this product has, until recently, been obtained. The uses of this mineral are constantly enlarging, and in this country alone the consumption amounts to 500 tons yearly. The price of refined ozokerite, commercially known as ceresin, ranges from 20c. per lb. for chemically pure white down to 6c. per lb. for crude black of a poor quality. The company proposes to mine 1,500 tons of wax yearly, and pay 7 per cent on a capital stock of \$1,250,000. The first shipment from the American mines arrived in New York in January this year and attracted considerable comment.—*Eng. and Min. J.*

Platinum in Canada.

A NOTEWORTHY discovery has been lately made. Platinum has been found *in place* in the nickeliferous ore of Sudbury, Canada, by Professor F. W. Clarke. This discovery was made accidentally in the course of determinative and analytical work upon the ore, which presents other peculiarities. While the amount found is of little or no commercial importance, it has a very great scientific significance, and is certainly something new. Platinum grains have been found in secondary rocks, such as recent sandstones, conglomerates, etc., but never before, so far as we are aware, in vein stuff, although it has long been looked for, and such an occurrence was to be expected. There is, therefore, always the chance that actual mines of platinum-bearing material, so often falsely reported, may actually be found, and that perhaps some of them may be of a paying grade. The number of localities and their wide distribution in this country point to such an outcome.

Exalgine.

EXALGINE is the name of the latest candidate for medical favor as a pain reliever. Drs. Dujardin-Beaumetz and Bardet have experimented with it, and found it in some respects preferable to antipyrin. To facilitate its use in prescriptions, they have given it the shorter name just mentioned, as more manageable than its full chemical appellation orthomethylacetanilide.—*Chem. and Drugg.*

Some doubt seems to have arisen as to the identity of exalgine on account of its description as *ortho*-methylacetanilide, as distinct from the *meta*- and *para*-isomeric compounds. In a communication to the Academy of Sciences (*Compt. Rend.*, Ap. 8, pg. 749) Mr. Giraud says: "The name *ortho*-methylacetanilide can be applied to but one substance, described by Beilstein and Kuhlberg under the name *aceto-ortho-toluid*, and prepared by means of *orthotoluidine* and *acetic acid*. The substance prepared by Mr. Brignonnet is not new; it was described by Hofmann in 1874. Its true designation is *methylacetanilide*, and it cannot exist under three modifications, for the phenyl radical contained in its molecule is not substituted. This substance is utilized in laboratories for the preparation of *monomethylaniline*, and is manufactured on a large scale and at a low price."—*Ph. Journ.*

Strophanthin.

HARDY and GALLOIS' method of preparing strophanthin is defective, inasmuch they employ alcohol acidified with hydrochloric acid, and consequently destroy the greater part of the strophanthin. Mr. Arnaud employs the following method: Finely powdered strophanthin seeds are exhausted by boiling with 70 per cent alcohol in an apparatus with reflux condenser for some hours. The greater part of the alcohol is then distilled from the extract over a water-bath, but the evaporation is continued in vacuo, leaving some liquid, which is cooled and, after removing the floating oil and resin, is filtered. The filtered liquid is heated in a water-bath, mixed with a small quantity of basic lead acetate and finely powdered litharge, and filtered again. Any lead in solution is removed by hydrogen sulphide. The clear liquid is then concentrated in a drying chamber at $50^{\circ} C.$ In a day or so the strophanthin crystallizes out, and is filtered off, keeping the temperature at 50° . If the concentration has not been carried too far, the syrupy liquid runs off gradually, and the crystals have simply to be drained on a porcelain slab and recrystallized several times from boiling water. In this manner 4.5 Gm. of the crystalline strophanthin is obtained from each kilo. of seed of *Strophanthus Kombé*, but some strophanthin is retained by the syrup.

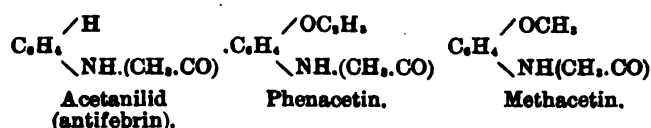
Strophanthin, $C_{10}H_9O_3$, is a white, very bitter substance, crystallizing in radiating spangles. These crystals soak up and retain water with great facility. Strophanthin forms a hydrate, which parts with its water in a dry vacuum or when dried in the air; if heated in a drying chamber, it melts below 100° and becomes colloidal, but

when previously dried in a vacuum it can be heated to 110° without alteration. When strophanthin is heated in the air, it burns without leaving a residue. It becomes pasty at 165°, losing its opacity and becoming brown with moderate rapidity. It is dextrogyrate, and with a 2.3 per cent aqueous solution the deviation, with sodium light, is +30°. It is scarcely soluble in cold water, one part requiring 43 of water at 18°; it is moderately soluble in alcohol, from which it is deposited as a varnish. It is insoluble in ether, benzene, and carbon bisulphide. Tannin precipitates it from the aqueous solutions.

From its composition it appears to be the homologue of ouabaine, $C_{25}H_{40}O_{11}$, which it resembles in poisonous properties. Both, when heated with diluted acids, decompose like glucosides, yielding a body which reduces Fehling's solution, but does not appear to be glucose.—*Compt. Rend.* and *J. Soc. Chem. Ind.*

Methacetin.

METHACETIN is another new antipyretic. According to its chemical composition, its full name should be acet-para-anisidin. Similar to phenacetin, or acet-para-phenetidin, it is derived from amido-phenol. The relation of these compounds with antifebrin (acetanilid) is shown by the following formulæ:



Methacetin, as used in Mahner's experiments, is a slightly reddish, odorless powder of saltish, bitter taste. The powder is composed of the fine crystalline scales, which melt at a temperature of 127° C. It is soluble in cold water, more so in warm water, and still more in alcohol. So far the new remedy has been only administered in febrile diseases of children. The abatement of temperature was gradual, and lasted for some hours. Perspiration was copious. In one case collapse set in; otherwise no disagreeable after-effects were observed. The dose for children was 3 to 5 grains.—*Chem. and Drugg.*

Animal Arrow Poison.

MOST of the arrow poisons of Africa hitherto known have been of vegetable origin; indeed, all the famous poisons are of this nature. Mr. H. M. Stanley has added one poison to the list which does not appear to be a product of the vegetable kingdom. In the Lower Congo district Mr. Stanley's force was assailed by a tribe of dwarfs, who used poisoned arrows. Five members of the expedition were hit by these arrows, four (black men) dying very shortly after, their sufferings having been intense. The fifth man—Lieut. Stairs—had a narrow escape. The poison of the arrow which hit him had been dry, and so he did not experience the full toxicity of the barb. It was afterwards found that the poison is manufactured from the dried bodies of red ants, or pismires, ground into powder, cooked in palm oil, and smeared over the wooden points of the arrows. What is the nature of the poison which causes death? The *Lancet* says it is formic acid, which exists in the free state in red ants, and is, in the pure state, so corrosive that it produces blisters on the skin; hence there is little ground, says our contemporary, for doubting that it was the "deadly irritant by which so many men had been lost with such terrible suffering." The multitude of curious insects encountered, which rendered their lives "as miserable as they could well be," bears out Mr. Stanley's idea that many similar poisons could be prepared from insects. It certainly is strange that, with the exception of cantharides, and perhaps of *blatta orientalis*, the insect world is so little used for active therapeutics. Not forgetting the fact that homoeopaths have long had that respect for the insect kingdom which the *Lancet* desires, we may mention that ptomaines as a source of toxicity are more likely than formic acid to have produced the paralytic symptoms which were exhibited by the dying men.—*Chem. and Drugg.*

Note by Ed. Am. Drugg.—That ptomaines are at the bottom of the toxic effect of this animal poison there can scarcely be any doubt. The poisonousness of decomposing or decomposed animal matter was already known to the ancients, and many deaths, no doubt, have been caused, both accidentally and intentionally, by ptomaines. Professor Edward Schaer, of Zurich, some years ago, published an extensive paper on this subject, which reviews the records of literature relating to it.

Castor Oil vs. Olive Oil as Lubricator.—The Italian Admiralty have recently caused to be carried out a number of experiments with a view to testing the comparative merits of castor oil and olive oil for lubricating purposes on board ship. From the results obtained, they have given orders that henceforth all exposed parts of machinery are to be lubricated exclusively with castor oil, while mineral oils are to be used for cylinder and similar lubrication.—*J. S. Chem. Ind.*

Use of Hydrogen Peroxide in Analysis.

LEAD peroxide may be most readily dissolved by treatment with dilute nitric acid and a solution of hydrogen peroxide. Half of the oxygen from each of the two peroxides unite to produce an effervescence of oxygen, even when cold, resulting in the formation of lead nitrate.

A similar action of hydrogen peroxide I have frequently found of advantage in effecting the solution of a precipitate produced by ammonia and consisting mainly of ferric and alumina hydrates, in which, however, after washing, a little manganese is retained as Mn_2O_3 . The latter body will resist solution in dilute acid, and under these circumstances a drop or two of hydrogen peroxide will instantly clear up the solution.

In the same manner ignited oxide of cerium or oxide of manganese may be readily dissolved by cold dilute acids mixed with hydrogen peroxide.—F. P. DUNNINGTON in *Journ. Anal. Chem.*

Color Test for Strychnine.

FLÜCKIGER (*Pharm. Zeitung*) proposes the following solution for testing strychnine: 0.01 Gm. of potassium dichromate is dissolved in 5 C.c. of water and mixed with 15 Gm. (8.15 C.c.) of sulphuric acid of sp. gr. 1.84 at 15°. When cold, the reagent is ready for use. A solid body to be tested for strychnine is moistened with a single drop of this liquid, or the powdered solid is scattered upon the liquid on a porcelain slab, or a saturated solution of the strychnine salt is let flow slowly over the acid, shaking very gently, so as to obtain a distinct zone. Certain substances, such as brucine, give a fine red color with the chromiferous sulphuric acid, and mask the reaction of strychnine. In case of a mixture of brucine and strychnine which does not at once give the strychnine reaction, the substance is placed upon a small moistened filter, and chlorine water is dropped upon it as long as a red color is thus produced. Dichlor-brucine is thus formed as an amorphous, easily soluble body, which passes rapidly into solution. The undissolved alkaloidal residue gives the reaction of pure strychnine.—*Chem. and Drugg.*

Detection of Very Small Quantities of Arsenic.

PROF. FLÜCKIGER finds that a concentrated solution of silver nitrate makes a very delicate test for arsenic, forming the yellow compound $\text{AsAg}_3 + 3\text{AgNO}_3$, with arseniuretted hydrogen. As small an amount as $\frac{1}{1000}$ Mg. of As_2O_3 has been detected in this way.

A solution of mercuric chloride, when acted upon by arseniuretted hydrogen, gives almost as sharp a reaction. When this solution is absorbed by blotting paper and exposed to arseniuretted hydrogen, a yellow stain is produced at first, which gradually changes to a brown. Zinc and hydrochloric or sulphuric acid are better for producing hydrogen than sodium amalgam, but the zinc must be entirely free from sulphur, arsenic, phosphorus, and antimony, so that when 10 Gms. of the metal are dissolved in dilute hydrochloric acid, the silver nitrate or mercuric chloride paper remains unchanged after being exposed to the gas for two hours, care being taken not to expose the silver nitrate paper to the light. The mercuric chloride solution is more convenient than the silver nitrate solution, since it is not affected by light.—*Abst. f. Arch. d. Ph.* in *J. Anal. Chem.*

Tests for Tannic and Gallic Acids.

WHEN ammonium chloride and ammonia are added to solutions of tannic acid, a white precipitate is formed, which rapidly becomes red. In solutions containing 1 part of tannic acid in 5,000 of water, the precipitation is slow, and it is best to drop in the ammonium chloride so as to form a layer on the top, then at the point of contact a distinct white line appears, even in solutions containing 1 in 20,000, whilst by holding against a black surface 1 in 50,000 may be detected. When solutions of gallic acid are treated in a similar manner, no precipitation occurs, but the liquid becomes red in strong solutions, and with dilute solutions a greenish-colored ring forms, even when the dilution is 1 in 100,000. A red coloration is produced in solutions of either of these acids by chlorine water and ammonia, and by potassium ferricyanide and ammonia. With the latter reagents a 1-in-10,000 solution of tannic acid becomes distinctly red, and the redness produced in a 1-in-30,000 solution is seen by looking down the test through the column of liquid, whilst, by comparing with a blank, a yellowish-brown coloration may be detected in a 1-in-100,000 solution.—S. G. RAWSON (Abstract in *J. Chem. Soc.* from *Chem. News*).

New Test for Copper.

M. DENIGÈS, of the Bordeaux Faculty of Medicine and Pharmacy, has recommended the following process: Place in a test tube 2 C.c. of a cold saturated solution of potassium bromide, and add 1 C.c. of concentrated sulphuric acid. At first the mixture will turn to a light yellow near the acid, but, on shaking, it will become colorless again, provided the bromide be free from bromate. Now two or three drops of the liquor under examination

are added, and if it contains even traces only of copper a carmine-red coloration will develop, becoming brighter on heating, and disappearing when water is added. The same reaction will take place even with copper salts in the solid state. A few precautions, however, are useful. For instance, the solution to be tested for copper should be previously acidulated with sulphuric acid, to separate insoluble sulphates, and avoid cloudiness during the colored reaction. It is a good plan, also, to prepare beforehand the reagent by adding to a saturated solution of potassium bromide half its volume of sulphuric acid, free from nitrous compounds, and filtering afterwards through asbestos to separate out the potassic sulphate. The presence of either nickel or cobalt will not affect the accuracy of the process.—*Chem. and Drugg.*

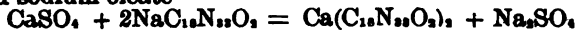
Estimation of Albumen in Urine.

THIS new method is considered more accurate than Esbach's. The latter plan consists merely in the complete precipitation of the albumen by picric acid, and the use of a tube so graduated that the depth of the deposit at the end of 24 hours indicates so many Gm. of albumen per liter of urine. This was found to be variable in its results when compared with those of coagulation by heat and nitric acid, for very slight changes of temperature influence the extent to which the precipitated albumen will "settle." The new method proposed consists in the use of tannic acid as the precipitant, and the suspension of the precipitate in the urine by means of mucilage. This mixture is then, after being diluted with water, poured into a vessel of certain capacity, which is placed over a white surface on which black lines are drawn. The amount of the "emulsified" urine necessary to obscure the lines will be in the inverse ratio to the quantity of albumen in the urine—a quantity easily estimated by the employment of a suitably graduated burette. The principle is the same as that introduced by Panum for the determination of the quantity of cream in milk, and can no doubt be made available for clinical work. The results obtained are given in tables, but, so far as can be gathered from these, the advantage of the plan over that of Esbach (a far simpler method) does not seem very great; neither plan is quite accurate.—A. CHRISTENSEN (Abstract *J. Chem. Soc.*).

Note on Clarke's Soap Test.

WHEN a standard soap solution is run into a solution of a calcium salt till a lather is formed, as for instance in determining hardness in water, it is commonly taken for granted that each equivalent of lime destroys an equivalent of soap.

Put in an equational form in the case of calcium sulphate and sodium oleate—



I find that an equivalent of lime requires $1\frac{1}{2}$ equivalents of soap, or CaSO_4 requires $2\frac{1}{2}\text{NaC}_{18}\text{H}_{35}\text{O}_2$.

In the case of magnesium salts the reading is rather more obscure, but an equivalent of magnesia requires rather more soap.

As the mean of many experiments I find that an equivalent of magnesia requires $1\frac{1}{2}$ equivalents of soap, or MgSO_4 requires $3\text{NaC}_{18}\text{H}_{35}\text{O}_2$.

I obtained these results both with oleic acid and with the solid fatty acids (commercial stearic acid).

Mr. Wanklyn's statement in his "Water Analysis," that magnesium requires $1\frac{1}{2}$ times as much soap as calcium, is well known to be incorrect, but it is probably based on the observation that magnesium requires $1\frac{1}{2}$ times as much soap as theory indicates, coupled with the erroneous assumption that calcium requires only its theoretical quantity.

It is a pleasing thing for soap consumers to find that a grain of chalk or magnesia in a water-supply destroys $1\frac{1}{2}$ or $1\frac{1}{2}$ times as much soap respectively as has been hitherto thought.—FRANK L. TEED (abstract), in *J. Soc. Chem. Ind.*

Volumetric Determination of Sulphates.

THE following method is proposed in the *Bulletin Soc. Chem.*, Paris: A solution of barium chromate is made by dissolving in 200 C.c. of distilled water 19.48 Gm. of neutral potassium chromate and 50 to 100 C.c. of pure hydrochloric acid, and there is poured in slowly, stirring to dissolve the precipitate formed, 24.35 Gm. barium chloride previously dissolved. Then make up to 1 liter, and filter. Of this solution, 50 C.c. precipitate from 0.3 to 0.4 of sulphuric acid. The excess of alkaline chromate involves a deduction as correction in all the readings. This correction may be determined once for all by precipitating in a flask marked at 1,000 C.c. 100 C.c. of the solution with an excess of ammonia, and reducing with the ferrous liquid 100 C.c. of the filtrate mixed with 5 C.c. of pure sulphuric acid. The ferrous liquid is prepared by dissolving 20 Gm. double iron and ammonium sulphate and 10 C.c. of pure sulphuric acid in 1 liter of water. The operation is conducted as follows: One Gm. pure dry potassium sulphate is dissolved in 600 C.c. of water in a flask marked at 1

liter, 100 C.c. of the barium chromate are added and shaken up. When the liquid begins to grow clear, it is supersaturated with ammonia, when the liquid becomes of a sulphur yellow. It is filtered, and 100 C.c. of the perfectly clear liquid are taken, and to them are added 5 C.c. of pure sulphuric acid. The solution of iron is dropped in from a burette holding 50 C.c. The liquid turns from red to olive-brown green, and at last bluish-green. At this moment little drops of the liquid are taken up with a glass rod and placed upon drops of ferricyanide on a white slab, stopping as soon as there is a blue tint. The solution of ferricyanide must be fresh, and so dilute as to appear colorless. The salt must not be used as a dry powder. The actual determination is performed in the same way. Chlorides and nitrates do not interfere; chlorates must not be present, and phosphates must be previously eliminated.—*Chem. and Drugg. and Chem. News.*

Determination of Lithium by Means of Fluorides.

THE reagent which A. Carnot has recently proposed is ammonium fluoride. It is found in commerce, but it requires to be purified, as it contains silico-fluoride in considerable quantity. For this purpose a few Gm. of the salt are dissolved in a small volume of water, a double volume of ammonia is added, the mixture is heated to a boil for a few seconds, let cool, filtered, and washed with ammonia. The silica is thus eliminated, and we have the fluoride in a strong ammoniacal solution. It is kept either in a covered platinum crucible or in a stoppered glass, where it may be left some days without undergoing any change. If there are in solution at most some decim. of a lithium salt, with quantities of other alkaline salts not more than ten or fifteen times greater, the author proceeds as follows: The solution is reduced to a few C.c. in a tared platinum capsule, ammonium fluoride is added and an excess of ammonia up to 15 to 20 C.c., according to the quantity of the salts. It is well mixed and let settle. There is formed a white, gelatinous precipitate of lithium fluoride, scarcely visible, and adhering in part to the bottom of the capsule. This is complete by the next morning. Almost all the liquid is decanted through a very small filter and replaced by a few C.c. of ammonia water with ammonium fluoride. It is stirred up with a platinum spatula and let settle. Soon after a second and a third decantation are made in the same manner, and the filter is washed with a few drops of the same reagent. All the soluble alkaline salts are thus removed, and we have, in part on the filter and in part in the capsule, all the lithium salt contaminated merely with ammonia and ammonium fluoride.

The volatile matters are expelled by heating very gently, the filter is burnt, its ash is treated with a few drops of dilute sulphuric acid, and all the liquid is collected in the tared capsule. It is evaporated and gently heated until acid vapors cease to appear, and the neutral lithium sulphate is weighed.

To take account of the solubility of lithium fluoride in the ammoniacal liquid, we measure the total volume of the filtrate, which generally ranges from 30 to 50 C.c. We may admit, in accordance with experiments, that 7 C.c. of the liquid contain approximately 2 milligrams. lithium fluoride, corresponding to 4 milligrams. lithium sulphate or 1 milligram. lithia. The quantity thus calculated is added to that found on weighing.—*Bull. Soc. Chim. and Chem. News.*

The Use of Bromine for the Estimation of the Cinchona Alkaloids.

At the annual meeting of the Chemists' Assistants' Association, held at London on May 2d, Mr. W. T. Fawcett read the following paper on this subject, for which he was awarded a prize by the Association. We take the paper from the *Pharm. Journal*:

The observation that a solution of sulphate of quinine required considerably more bromine water to produce in it a permanent yellow tint than a similar solution of sulphate of cinchonidine suggested the employment of this reaction as a means for estimating the cinchona alkaloids.

The investigations of Laurent, Anderson, Cahours and Etard, Bloram, Jackson, and Eiloart have shown: (1) That bromine is capable of combining with alkaloids to form bromo-derivatives; (2) That the alkaloids differ in the amount of bromine with which they can combine; (3) That the amount of bromine absorbed depends on the physical conditions (temperature, solution, etc.) of the substances.

With a view to insuring the constancy of these conditions, the following process has been devised: One Gm. of the alkaloid or alkaloidal salt is dissolved in just sufficient dilute sulphuric acid, and the solution is diluted with water to 600 cubic centimeters in a cylindrical vessel. The temperature of the solution must not be much below 60° F. It is now titrated with bromine water, contained in a burette provided with a well-fitting float, the first 10 C.c. of which have immediately before been estimated in the usual way. The bromine water is run in in quantities of 5 C.c. (the color being allowed to disappear after each addition) until a permanent yellow tint is

produced. The excess of bromine is estimated colorimetrically by running the bromine water into a vessel of the same dimensions and containing an equal quantity of pure water till an identical tint is obtained. From this the actual amount of bromine decolorized by the alkaloid is readily calculated.

A series of experiments were made with the object of ascertaining the number of atoms of bromine absorbed by a molecule of each alkaloid. It was found that a molecule of quinine, quinidine, and cupreine each absorbed approximately 6 atoms of bromine; hydroquinine, 4 atoms; and cinchonidine, cinchonine, and amorphous quinine, each 2 atoms. The figures obtained were only approximately correct, commercial alkaloids having been employed. In order to confirm the results with pure alkaloids, the quinine and cinchonidine were submitted to processes of purification, and it was then found that their bromine absorption equivalents exactly corresponded with those given above. A correction was made for the impurities found in the hydroquinine, with the result that the bromine absorption equivalent of that alkaloid was also considered to be correct.

The behavior of bromine water on mixtures of quinine and cinchonidine, and of quinine and hydroquinine, was next observed. It was found that the bromine absorption equivalent of the mixture was the sum of the bromine absorption equivalents of the constituents. It is therefore possible to estimate the amount of an impurity in an alkaloid by this process, at any rate when the quantity of an impurity is not very minute. It was found that the double compound of quinine and cinchonidine described by Kerner and Weller as "latent cinchonidine" has a different bromine absorption equivalent from a mixture of the alkaloids. It is therefore necessary, in estimating by this process quinine or cinchonidine containing the double compound, to decompose it by heating previously to 248° F.

A specimen of commercial sulphate of quinine was now completely analyzed, the bromine absorption equivalent being estimated at each stage of the operation. It was found that after drying, after removing the cinchonidine, and after removing the hydroquinine, the alkaloid required precisely the amount of bromine that quinine, in these various degrees of purity, was calculated to require. When, however, an impure quinine sulphate of a similar composition was artificially prepared, the bromine absorption equivalent was found to be lower than that given by the original specimen. This was probably due to the cinchonidine in the latter being in the form of the double compound. A number of essential experiments showed that the process gives constant results, the maximum error when 1 Gm. of alkaloid is used being .008 Gm. of bromine.

Specimens of English, French, German, and Italian quinine were estimated by the process, with the result that 1.029 Gm. of bromine was found to be the average absorption equivalent of 1 Gm. of commercial sulphate of quinine.

If the usual qualitative tests for impurities be first applied and the water be removed, and the double compound of quinine and cinchonidine decomposed by heating to 248° F., the author considers that the process gives a ready and reliable means of estimating the value of commercial sulphate of quinine.

Revised Pharmacopœial Descriptions and Tests.

From the latest report of the Pharmacopœia Committee of the German Pharmaceutical Association we select the following portions as being of direct practical interest in this country.

Those portions of the text which are included in quotation marks (" ") represent changes in or additions to the original text.

Of course, all these modifications are merely recommendations submitted to the Government Pharmacopœia Commission, and are still subject to criticism.

The nomenclature has been changed to that used in this country.

1. *Liquor Calcis.*

Lime.....1 part.
Water.....a sufficient quantity.

Slake the lime with four parts of water, then add to it, under stirring, 50 parts of water. After several hours pour off the liquid, and again pour on the residue 50 parts of water.

When any of the liquid is required, pour it off clear from the sediment.

A clear, colorless liquid of strongly alkaline reaction.

100 C.c. of lime water "should not require less than 4 C.c. of normal hydrochloric acid for neutralization."

Note.—The present Germ. Pharmacopœia requires that 100 C.c., when mixed with 3.5 to 4 C.c. of normal hydrochloric acid, should not yield an acid liquid. Only one number should be given as minimum limit.

2. *Aqua Destillata.*

A clear liquid, leaving no residue on evaporation, and without color, odor, or taste.

It should neither be "altered" by mercuric nitrate nor

by nitrate of silver, nor should it be rendered cloudy when mixed with twice its volume of lime water.

"On acidulating 100 C.c. of the water with diluted sulphuric acid, and then adding 1 C.c. of solution of chloride of zinc and starch, no color should be developed within 10 minutes."

"100 C.c. of the water, mixed with 1 C.c. of diluted sulphuric acid and 0.5 C.c. of solution of permanganate of potassium (1 in 1,000), should retain the red color for some time if set aside in a closed flask. Nor should the color be entirely discharged when the liquid is heated to incipient boiling."

Note.—The tests of distilled water needed a completion by the addition of one for nitrous acid. Even the least traces of the latter (such as is, for instance, contained in 0.002 Gm. of fuming nitric acid) are indicated by solution of iodide of zinc and starch in presence of a little sulphuric acid.

Regarding the test for organic matter, the requirements of the proposed test are about the same as those of the U. S. P. Well-water may be allowed to contain so much (but no more) organic matter than 100 C.c., acidulated with sulphuric acid, may discharge the color produced by 1 C.c. of the standard permanganate solution on boiling. But distilled water should not discharge all the color produced by only $\frac{1}{4}$ C.c. of the permanganate.

3. *Creosotum.*

A clear, faintly yellowish, neutral, oily liquid, "not" turning brown when exposed to sunlight, strongly refractive, of a penetrating, smoky odor and burning taste. The spec. grav. is "not below 1.070." Creosote usually distills over between 205 and 220° C., does not congeal when cooled to -20° C., and is miscible to a clear liquid with ether, alcohol, and carbon disulphide. It requires 120 parts of hot water to form a clear solution, which becomes cloudy on cooling, and gradually clears again with separation of oily drops. In the aqueous solution separated from the latter, bromine water produces a reddish-brown precipitate. Another portion of the solution, treated with a very small quantity of ferric chloride, assumes a grayish-green or evanescent blue tint, and finally turns brown, with separation of brown flakes. "An alcoholic solution of creosote is colored deep blue by a minute quantity of ferric chloride, and dark green by a larger quantity."

When mixed with "two and one-half times" its volume of solution of soda [15 per cent], it forms a clear mixture which does not become dark, and remains clear when diluted with much water " (up to 50 times its volume)."

"When mixed with ten volumes of an alcoholic solution of potassa (1 in 5), creosote should solidify, after a short time, to a firm, crystalline mass."

On shaking creosote "in a dry glass vessel" with an equal volume of collodion, no gelatinous mass should appear. When mixed with three volumes of a mixture of three parts of glycerin and one part of water, creosote should remain almost insoluble in it.

"On shaking 1 C.c. of creosote with 2 C.c. of petroleum benzin and 2 C.c. of solution of baryta, the benzin layer should not acquire a blue or dirty, nor the aqueous layer a red tint."

[Note.]—The reasons for fixing the spec. grav. of creosote at 1.070, and some of the reasons for introducing certain other tests, due to the necessity of making sure that both guajacol and creosol are present in proper quantity, have already been explained by us elsewhere.]

The present Germ. Pharm. requires, among other things, that when creosote is shaken with 10 times its volume of water of ammonia, its volume should not be diminished to more than $\frac{1}{4}$. But, since $\frac{1}{4}$ of all the creosol and $\frac{1}{5}$ of all the guajacol present in normal creosote are soluble in the stated quantity of water of ammonia, it follows that normal creosote must yield to the ammonia much more than $\frac{1}{4}$ of its volume. As a poor creosote, therefore, will stand this test best, the test has to be rejected.

The test with solution of baryta and benzin is introduced for the purpose of ascertaining whether the creosote has been sufficiently purified from the poisonous pyrogallol ethers which exist in beechwood tar.

4. *Oleum Carvi.*

[*Oleum Carvi*, Ph. Germ.]

The higher-boiling portion ("carvol") of the oil from the fruit of *Carum Carvi*.

Colorless or pale-yellowish liquid, attaining its full boiling point at 224° C., and possessing a fine caraway odor. Spec. grav. "0.960." [The U. S. Ph. gives the spec. grav. of ordinary oil of caraway.] A mixture of the oil with an equal volume of alcohol is rendered faintly violet or reddish by "a very minute quantity of" solution of ferric chloride. On mixing 10 parts of oil of caraway with 8 parts of alcohol and 1 part of ammonia, and then saturating the mixture with hydrosulphuric acid gas, a white, crystalline mass results. At least 8 drops of the oil must form a clear solution with a mixture of 3 C.c. of alcohol* and 1 C.c. of water.

* Here and in the other descriptions the alcohol of the German Pharmacopœia, having the spec. grav. 0.822, is understood.

Note.—Though the above description is not applicable to ordinary commercial oil of caraway, but only to its higher-boiling fraction, carvol, the committee do not think it advisable to change the name, although it recommends the introduction of the word "carvol" in the description.

A good distinguishing test between ordinary oil of caraway and carvol—besides the spec. grav. and boiling point—is the increased solubility of carvol in a mixture of 2 vols. alcohol (Ph. G.) and 1 of water; 3 C.c. of this readily dissolve up to 10 drops of carvol, but are unable to completely dissolve as little as 1 drop of ordinary oil of caraway.

It has been found, as the result of many experiments, that the reddish tint produced in a concentrated alcoholic solution of carvol makes its appearance always, provided only a minute quantity of ferric chloride is used. It is best to use, for a mixture of 10 drops each of carvol and alcohol, 1 small drop of a solution of ferric chloride of 1 in 100. If more iron solution is added, the tint is changed.

5. *Oleum Caryophylli.*

The ethereal oil of cloves, having a yellowish to brown color, and a sharp, aromatic odor or taste. It attains a full boil at 247° C. Spec. grav. "1.050 to" 1.060. [U. S. Ph. says about 1.050.] "On shaking 5 drops of the oil energetically with 10 C.c. of lime water, a flocculent precipitate will separate, partly adhering to the walls of the vessel." A solution of 2 drops of oil of cloves in 4 C.c. of alcohol acquires a "green" color upon addition of 1 drop of solution of ferric chloride; if 1 drop of diluted solution of ferric chloride (1 [of original ferric chloride solution] in 20) is used, the color will be blue, "then rapidly change through red to yellow."

On agitating 1 Gm. of oil of cloves with 20 C.c. of hot water, the latter "should scarcely" redden blue litmus paper. If this aqueous liquid is filtered, after cooling, and then treated with 1 drop of ferric chloride solution, it may become "transiently grayish-green," but should not become blue. Oil of cloves should form a clear mixture with "from 1 to 2 volumes" of diluted alcohol [Ph. Germ., sp. gr. 0.892].

Note.—The spec. grav. had been depressed by the last Germ. Pharm. as low as 1.041, but this admits an oil containing too much of hydrocarbon ("light oil of cloves"). At the same time, it would have been too exacting to require a spec. grav. not less than 1.060, as this corresponds to almost pure eugenol.

Note.—When oil of cloves is kept for some time, it becomes slightly acid. Hence it is too exacting to require complete neutrality of the water which had been agitated with the oil. The present Ph. Germ. requires that the filtered water should not be colored either blue or green by ferric chloride. But it has been found necessary to alter the requirements so that only a transient grayish-green tint may be produced in the clear filtrate by 1 drop of ferric chloride solution, which tint soon changes to yellow. If a blue color, even only temporarily in the moment of mixing, should appear, this would indicate the presence of phenol. According to the quantity of the latter, the blue color increases both in intensity and in duration, but it also passes finally over into a reddish yellow. This reaction is important as the only sure test for carbolic acid in oil of cloves.

6. *Oleum Cinnamomi.*

The ethereal oil of cinnamon, possessing the aroma of the latter. Yellow or brownish liquid, having a spec. grav. of 1.055 to 1.065 [the U. S. Ph. makes no distinction between oil of Chinese and oil of Ceylon Cinnamon, and gives the sp. gr. at "about 1.040"], and clearly miscible with alcohol in all proportions. On mixing 4 drops of the oil with 4 drops of fuming nitric acid, they unite, "without effervescence," to a mass or crystals or lamellæ.

In a solution of 4 drops of the oil in 10 C.c. of alcohol, 1 drop of solution of chloride of iron may produce only a brown, but not a green or blue color. 10 C.c. of hot water, shaken with 1 drop of the oil, has a sweet, afterwards burning taste; "upon addition of subacetate of lead it acquires a white turbidity, without separating yellow flakes."

Note.—The object of the last-added test (with subacetate of lead) is to show the absence of oil of cloves, which would cause a separation of flakes if present in the proportion of as low as 10 per cent. If more were present, the whole mixture would become intensely yellow. This method of testing for oil of cloves in the expensive oil of cinnamon is preferable to that by means of ferric chloride in an alcoholic solution of the oil. If oil of cloves is present, an effervescence occurs upon addition of fuming nitric acid, and no crystals are then formed, owing to the heat developed. But even in genuine oil of cinnamon no crystals would be produced if larger amounts of oil and acid were mixed than 4 drops of each.

7. *Oleum Cocos.*

[Cocoanut Oil.]

The fat of the seed-kernels of *Cocos nucifera*, of white color and the consistence of butter, melting to a clear liquid at 23 to 30° C., and then developing a faint, peculiar odor.

8. *Oleum Tiglii.*

[*Oleum Crotonis*, Ph. Germ.]

The fatty, viscid oil expressed from the seed-kernels of *Croton Tiglium*, of a brownish-yellow color, a "disagreeable, peculiar" odor, and reddening moistened [blue] litmus paper. "Spec. grav. 0.940 to 0.960. The oil is soluble in 2 volumes of hot, absolute alcohol."

"On briskly agitating together 2 volumes of the oil with 1 volume of fuming nitric acid and 1 volume of water, it should not congeal, either wholly or in part, within 1 to 2 days. On dissolving 1 Gm. of the oil in a mixture of 5 Gm. of chloroform and 10 Gm. of alcohol, adding 0.9 Gm. of powdered iodine and 1.2 Gm. of powdered mercuric chloride, and setting the mixture aside in a closed vial, repeatedly agitating, the mixture should become decolorized within one hour. Upon afterwards adding 0.1 Gm. of iodine, the reddish tint should remain undischarged for at least one hour."

Note.—The committee investigated the properties and reactions of the oil, which were expressed from the seeds for this purpose by themselves.

A prominent characteristic of croton oil is its peculiar, disagreeable odor, very noticeable in the expressed oil. If the oil is extracted from the seeds by volatile solvents (benzin, carbon disulphide, alcohol, etc.), the subsequent volatilization of the solvent dissipates a portion of the acidity (the escaping vapors are very acrid) as well as of the odor of the oil. An oil thus prepared is sometimes almost odorless.

The spec. grav. of croton oil is a good criterion of its purity, since it is higher than that of most fatty oils. The oil expressed by the committee had a spec. grav. from 0.944 to 0.955. Other samples, reputed to be genuine, varied between 0.941 and 0.960. Of other fatty oils, only castor and linseed oil approach croton oil in spec. grav.

Another special characteristic of croton oil is its solubility in 2 volumes of absolute alcohol. While the oil prepared by the committee was only soluble in boiling alcohol, and separated again on cooling, various commercial sorts were soluble in the cold, which can be due only to a different quality of seeds or to a different method of preparation. Unfortunately, the solubility in absolute alcohol does not permit any conclusions as to the purity of the oil, for, although olive, linseed, and poppy oil are not at all dissolved by alcohol, when alone, yet in presence of croton oil they are as soluble in it as the latter itself. Even a mixture of 1 volume of croton and two volumes of linseed oil is still dissolved by absolute alcohol; so also a mixture of equal volumes of croton and olive oil.

A nearly certain proof of the absence of a drying oil is furnished by the elaidin test, which leaves genuine croton oil, during many days, liquid and of a light, turbidly yellow color, while if the oil is mixed with a non-drying oil it will solidify within one day, or separate granular masses, according to the quantity of adulterant present. Some sorts of croton oil, when subjected to this test, acquire a dark color; but the cause of this is unknown. The oil obtained by expression is not rendered darker by nitrous acid. It should be mentioned, however, that a mixture of croton and castor oil sometimes requires two days before solidifying. When executing the elaidin test, great care is to be bestowed upon the strength of the nitric acid, that is, upon its contents of NO₂, since upon this depends the whole success. The acid should have a deep reddish-yellow color, and give out vapors of the same tint. The acid is first put, by means of a pipette, into a graduated glass cylinder, next the water, and lastly the oil. The whole is then well shaken, loosely stoppered, and set aside, the shaking being occasionally repeated.

Since this test does not permit the detection of linseed, poppy, and some other drying oils, the iodine absorption test was added, since croton oil has a high power of absorbing iodine. The test is executed in this manner: 1 Gm. (exact weight) of the oil is first put into a graduated cylinder, then 5 Gm. of chloroform and 10 Gm. of alcohol, next 0.9 Gm. (exact weight) of powdered iodine, and 1.2 Gm. of powdered mercuric chloride. The cylinder is then well stoppered and repeatedly well shaken. The iodine and mercurial salt will shortly become dissolved. The yellowish-red color which the iodine imparts to the mixture disappears after a while in consequence of a compound being formed, and red iodide of mercury gradually crystallizes out. Inside of one hour all the color has been discharged, unless the croton oil was mixed with olive oil, which has a lesser affinity towards iodine than the former. If the color has been discharged inside of the hour, an additional 0.10 Gm. of powdered iodine is added, and the whole again shaken until the iodine is dissolved. If linseed or poppy-seed oil is present, the color will again be discharged after a short time (proportionate to the quantity of these oils present). If the croton oil was pure, the bright-yellow color will remain unchanged for several hours, and will usually not disappear entirely within 12 to 24 hours.

These tests permit the determination of the purity of croton oil with sufficient certainty. The reliability of the above given modification of Hübl's iodine method has been proven by a large number of comparative experiments.

Testing the Purity of Reagents.

(Continued from page 98.)

34. *Potassii Permanganas purissimus* (KMnO₄).

Dark-violet, large crystals, containing not less than 99 per cent of the pure salt, and free from sulphuric acid, as shown by the following test: On heating 8 Gm. of the salt with 150 C.c. of water and 15 C.c. of absolute alcohol, until all the color has been discharged, the filtrate, mixed with a few drops of acetic acid and chloride of barium, should not become cloudy on standing for several hours.

35. *Potassii Iodidum*.

The purity of this salt should correspond to the requirements of the Pharmacopoeia.

Note.—When iodide of potassium is to be used for preparing volumetric solution of iodine, the salt should be free from iodate. The presence of the latter is shown by the immediate appearance of a blue tint when an aqueous solution of the salt (1 in 20), mixed with a little gelatinized starch, is treated with dilute sulphuric (or hydrochloric) acid. Dr. Krauch recommends to test for iodate in the manner directed under *Acidum hydrochloricum* (see our last March number, page 44), in the test for chlorine.

When larger quantities of iodide of potassium are examined for iodate, a violet color will always be developed by the before-mentioned test. But if a blue color were to appear, the quantity of iodate present would be objectionable.

36. *Potassii Nitris purissimus* (KNO₂).

White or very faintly yellowish deliquescent sticks, containing about 90 per cent of pure nitrite of potassium.

Quantitative estimation: The amount of pure nitrite is determined volumetrically by means of permanganate. The strength of the latter is adjusted on the basis of a solution of pure nitrite of silver of known strength.

On adding sulphide of ammonium to an aqueous solution (1 in 20) of the salt, no precipitate should be produced (abs. of heavy metals).

37. *Potassii Sulphocyanidum purissimum* [*Kalium rhodanatum*. CNSK].

White crystals yielding a clear solution with water and with warm absolute alcohol (1 in 10).

The aqueous solution (1 in 20) should not be affected within 5 minutes by chloride of barium (abs. of sulphuric acid).

On adding a little diluted hydrochloric acid (1 C.c. of HCl, sp. gr. 1.190, mixed with 10 C.c. of water) to the solution of the salt (1 in 20), it should remain entirely colorless (abs. of iron).

Addition of sulphide of ammonium to the aqueous solution should produce neither a precipitate nor brown color (abs. of other heavy metals).

Note.—Dr. Krauch states that he often found traces of lead and iron even in the purest specimens of the salt obtainable in commerce. For analysis it is absolutely necessary to have a salt completely free from these impurities.

38. *Potassii Antimonas purus* [*Kalium stibicum*. K, H, Sb, O].

A white powder. On dissolving 1 part in 250 of water, the solution should be clear and neutral. It yields a precipitate with a concentrated solution of chloride of sodium.

39. *Aqua Ammonia*.

A clear, colorless liquid, having the spec. grav. 0.925, and containing 20 per cent of gaseous ammonia. [Note by Ed. AMER. DR.—Of course it is often immaterial whether the spec. grav. or percentage of water of ammonia varies a little from that here given or not. Nevertheless it is a great advantage if any firm will guarantee to sell, as a reagent, no other water of ammonia but that which has a definite spec. grav. or percentage.]

Test for pyridine and chlorides: On diluting 10 C.c. of water of ammonia with about 30 C.c. of water, and supersaturating with nitric acid, the liquid should remain colorless, and on subsequent addition of nitrate of silver no alteration should take place.

Dr. Krauch confirms the statement of other observers that pyridine as well as pyrrol are frequent impurities in commercial water of ammonia.

On evaporating 15 Gm. of water of ammonia in a porcelain capsule on a water-bath, not more than minimal traces of residue should remain. Small traces are always found; the fixed matter is probably derived from the containers.

The absence of metals and of sulphates is tested for in the usual manner.

Test for carbonate: On mixing 10 C.c. of water of ammonia with 10 C.c. of water and 40 C.c. of lime-water, no cloudiness should be produced.

40. *Liquor Ammonii Sulphidi* (Solution of Sulphide of Ammonium).

A colorless or only faintly yellowish liquid, which, when treated with acids, gives off an abundant amount of hydrosulphuric acid gas without throwing down a colored precipitate.

Test for carbonate of ammonium and free ammonia: On adding lime-water or solution of sulphate of magnesium to sulphide of ammonium, no precipitate should appear, even on warming.

41. *Magnesia*, free from Sulphuric Acid.

Since both carbonate of magnesium and magnesia cannot be deprived completely of sulphuric acid, and an absolutely pure magnesia is occasionally wanted for special purposes, this was obtained by oxidizing magnesium.

Test for sulphuric acid: Dissolve 3 Gm. in moderately dilute hydrochloric acid, dilute with water to 100 C.c., heat to boiling, and add chloride of barium. No sign of sulphate of barium should appear within twelve hours.

42. *Sodii Bisulphid purus*.

White powder, having a strong odor of sulphurous acid.

Contains about 90 to 95% of the true bisulphite. The strength is determined by means of one-tenth normal solution of iodine.

Test for arsenic: Mix 5 Gm. of the salt with pure, concentrated sulphuric acid, and evaporate to dryness. The residue should not be altered by aqueous solution of hydrosulphuric acid, nor rendered yellow by addition of solution of molybdate of ammonium acidified with nitric acid, and application of a gentle heat.

Owing to the constant loss of sulphurous acid, it is practically impossible to obtain a 100% salt in the market.

43. *Sodii Carbonas crystallisatus purissimus*.

Large, translucent crystals, yielding a clear solution with water.

On mixing 20 Gm. with an excess of diluted hydrochloric acid, evaporating, drying the residue for some time at 100° C., and then redissolving with a little hydrochloric acid in about 150 C.c. of water, a clear solution should be produced, free from silicic acid flakes.

A solution of 10 Gm. in 150 C.c. of water, faintly acidulated with hydrochloric acid, heated to boiling, and treated with chloride of barium, should show no trace of sulphate of barium after twelve hours (abs. of sulphuric acid).

Nitrate of silver should not affect a solution of 5 Gm. of the salt in 50 C.c. of water and faintly acidulated with nitric acid (abs. of chlorine).

Test for arsenic: Put 10 Gm. of metallic zinc free from arsenic into a flask of about 200 C.c. capacity, forming part of a Marsh's apparatus, and generate hydrogen by means of diluted sulphuric acid (1 : 3). After the apparatus and reagents have been shown to be free from arsenic, dissolve 30 Gm. of the cryst. carbonate of sodium in a little water, supersaturate it with diluted sulphuric acid (known to be free from arsenic), and pour the solution gradually into the generator, maintaining a slow current of gas for about half an hour. No trace of an arsenical mirror should become visible during that time.

Note.—Arsenic has been found in carbonate of sodium both by Fresenius and by Otto.

Test for heavy metals: Dissolve 20 Gm. in 60 C.c. of water, supersaturate with hydrochloric acid, and add ammonia and sulphide of ammonium in slight excess. No precipitate, cloudiness, or green coloration should appear.

Phosphoric acid is tested for as directed under *Potassa purissima*.

Note.—A carbonate of sodium of the quality above specified is necessary only in special cases. Usually the so-called "Natrium carbonicum purissimum" of commerce is sufficiently pure for analytical purposes. This usually contains only traces of iron, chloride of sodium, and sulphate of sodium.

The ordinary crude carbonate may contain hyposulphite and sulphide of sodium, besides silicates, arsenic, iron, chlorides and sulphates of sodium and of other metals. Chlorides and sulphates are particularly common.

44. *Sodii Chloridum purum* (Natrium chloratum chem. purum).

Five Gm. of the salt yield, with 20 C.c. of water, a clear and neutral solution. On diluting this to 80 C.c., heating to boiling, and treating with chloride of barium, no reaction for sulphuric acid should appear after several hours.

45. *Soda purissima* (Natrium hydricum purissimum e Natrio).

Note.—For the same reason as given under *Potassa*, we give a detailed description of the various commercial varieties of soda, so that our readers may know what to expect when they order one or the other of them.

White, crystalline lumps, soluble to a clear solution in water, and free from alumina. (Tests same as in the case of *potassa purissima*.) After having shown the absence of alumina, the faintly alkaline solution remaining after this test should not be altered by oxalate of ammonium (abs. of calcium), or by sulphide of ammonium (abs. of heavy metals).

Tests for chlorine, sulphuric and silicic acids as in the case of *potassa*.

Only traces of carbonic acid permissible. A solution of 2 Gm. of this quality of soda in 10 C.c. of water, when

poured into a mixture of 8 C.c. of hydrochloric acid (1 : 120) and 8 C.c. of water, yields a liquid in which only slight, minute bubbles are visible, but no effervescence.

46. *Soda pura* (Soda alcohole depurata. Natrium hydricum alcohole depuratum. Natrium hydricum purum).

A white, crystalline mass, or white sticks, forming a clear and colorless solution with water.

On dissolving 10 Gm. in water to make 100 C.c., supersaturating with acetic acid, then adding ammonia in slight excess, only trifling flakes of alumina should separate. Subsequent addition of oxalate or sulphide of ammonium should not produce any precipitate.

Tests for nitric and silicic acid and chlorine, as in the corresponding quality of potassa.

Test for carbonic acid, as under No. 45.

Test for sulphuric acid: A solution of 1 in 20, after being acidulated with hydrochloric acid and treated with chloride of barium, is rendered only faintly turbid, so that a portion of the liquid, in a test-tube of 2 Cm. in diameter, does not become opaque.

Note.—The commercial brands of this quality of soda often contain considerable sulphuric acid and chlorine.

47. *Soda depurata* (Natrium hydricum depuratum).

White, crystalline lumps or sticks.

General tests as in the corresponding quality of potassa. The usual impurity occurring in this kind of soda is chloride, from 1 to 2 per cent.

48. *Sodii Nitras purissimus*.

Colorless crystals, yielding a clear solution with water.

Test for calcium and heavy metals: A solution of 5 Gm. of the salt in 50 C.c. of the water should be neutral, and should not be altered by ammonia, oxalate of ammonium, and sulphide of ammonium. A portion of the original solution, slightly acidulated with hydrochloric acid, is not altered by hydrosulphuric acid.

A solution of 5 Gm. in 100 C.c. of water is not affected by chloride of barium, even after standing some time (abs. of sulphuric acid).

No cloudiness should be produced by nitrate of silver in a solution of 1 in 20, acidulated with nitric acid.

49. *Sodii Nitris*.

Small, colorless crystals or sticks, containing 98 or 100 per cent of the pure salt. The strength is estimated as in the case of Potassii Nitris.

Heavy metals must be absent, as shown by the fact that hydrosulphuric acid should not affect the aqueous solution of the salt.

50. *Sodii et Ammonii Phosphas* ($\text{Na}(\text{NH}_4)\text{HPO}_4 \cdot 4\text{H}_2\text{O}$).

Colorless crystals, yielding, when heated on the loop of a platinum wire, a clear and colorless bead.

The precipitate caused in an aqueous solution of the salt by nitrate of silver should entirely dissolve upon addition of nitric acid (abs. of chloride).

51. *Sodii Tungstas purissimus* (Natrium wolframicum purissimum).

Colorless crystals.

Determination of tungstic acid: Decompose the salt by hydrochloric acid, expel the excess of the latter completely by a heat of 120–125° C., dissolve the resulting chloride of sodium with water, filter, wash the tungstic acid remaining on the filter with diluted solution of nitrate of potassium, and afterwards with very dilute nitric acid, finally ignite and weigh.

Test for chloride and sulphate: Boil the aqueous solution (1 in 20) with nitric acid, filter, and to a portion of the filtrate add a few drops of solution of nitrate of silver, when not more than slight turbidity should occur. Treat another portion of the filtrate with chloride of barium, which also should cause only a faint turbidity.

Note.—Dr. Krauch states that some commercial brands of this salt are very impure. He found in one sample 30 per cent of carbonate of sodium (calculated as crystallized).

52. *Platini Chloridum purum*.

Brownish-yellow, dry, crystalline fragments.

Solubility: 1 Gm. should form a clear solution in 10 C.c. of alcohol.

Note.—If the alcoholic solution leaves a notable greenish-yellow residue, this is probably due to the presence of platinum chloride. This impurity is occasionally met with. Such an impure salt usually yields a very dark-brown aqueous solution (1 in 10).

Foreign matter: On strongly igniting 2 Gm. of the salt, digesting the residuary metallic platinum during fifteen minutes upon a water-bath with a mixture of 5 C.c. of nitric acid (sp. gr. 1.200) and 20 C.c. of water, filtering, evaporating to dryness, and igniting the residue (if any), not more than a trace of fixed residue (at most 4 to 5 milligrammes) may remain.

Note.—Such traces are unavoidable, being derived from the vessels in which the platinum is subjected to the action of acids.

53. *Plumbi Oxidum purissimum*.

Test for carbonate, copper, alumina, and metallic lead: Upon 2 Gm. of the oxide, in a test-tube, pour 5 C.c. of

water, then add gradually an excess of acetic acid. No carbonic-acid gas should be given off. The resulting solution should be clear, or not more than faintly turbid, and should not show a precipitate of metallic lead. Precipitate the acetic solution with sulphuric acid, and filter. The filtrate, when supersaturated with ammonia, should not separate flakes of alumina, and should not exhibit a blue or bluish tint.

54. *Stanni Chloridum crystallisatum purum* ($\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$).

Colorless crystals.

Test for earths and alkalis: On dissolving 3 Gm. in 100 C.c. of water, adding hydrochloric acid, then precipitating with hydrosulphuric acid, filtering, and evaporating the filtrate, only traces of residue may remain.

An aqueous solution (1 in 100), when acidulated with hydrochloric acid, should yield no precipitate with chloride of barium (abs. of sulphuric acid).

On heating the salt with solution of caustic soda, no ammonia should be given off.

On boiling 2 Gm. of the salt with 10 C.c. of pure concentrated hydrochloric acid for a few minutes, the liquid should remain perfectly clear and colorless (abs. of arsenic).

Note.—The commercial salt is often contaminated with much sulphuric acid.

55. *Uranii Nitras purissimus crystallisatus* ($\text{UrONO}_2 \cdot 3\text{H}_2\text{O}$).

Large, greenish-yellow crystals. The aqueous solution (1 in 20), when tested with chloride of barium, should yield no cloudiness after standing 5 minutes (abs. of sulphuric acid). On adding an excess of carbonate of ammonium to the aqueous solution (1 in 20), no cloudiness should occur (abs. of earths). If 5 Gm. are mixed with 5 C.c. of hydrochloric acid, then diluted to 100 C.c., and a current of hydrosulphuric acid passed through the liquid, no precipitate should be produced (abs. of other metals).

Test for uranous salt: On dissolving 1 Gm. in 20 C.c. of water, acidulating with 1 C.c. of sulphuric acid, and adding 1 drop of normal solution of permanganate of potassium (of which 1 C.c. = 0.0056 Fe), a permanent red tint should be produced (absence of uranous salt).

56. *Zincum metallicum sine arseno* (metallic zinc, absolutely free from arsenic).

Of metallic lustre, and available either granulated, or in powder, or in sticks.

Test for arsenic: Introduce 20 Gm. into a 200 C.c. flask, forming part of a Marsh's apparatus, and generate hydrogen gas by means of diluted sulphuric acid (1 to 3 of water), until most of the metal is dissolved, which should take several hours. No trace of arsenical mirror should make its appearance during this time.

[Note.—In this quality of zinc, the main stress is laid upon the complete absence of arsenic, while no material importance is attached to the possible presence of other impurities. The next succeeding variety of metallic zinc is not only free from arsenic, but also from almost every trace of other metals.]

57. *Zincum metallicum purissimum*.

Test for arsenic: As in the preceding.

Test for iron, lead, copper, etc.: Dissolve 10 Gm. with about 60 C.c. of water and 15 C.c. of pure concentrated sulphuric acid in a little flask, closed with a rubber valve. The solution should show at most unweighable traces of undissolved matter (lead, etc.). After the zinc has been almost entirely dissolved, add 1 or 2 drops of normal permanganate, which should cause a distinct reddish tint (showing that there are, at most, but minute traces of iron present).

If a very exact determination of the iron is required, a separate assay with permanganate should be made upon the diluted sulphuric acid without the zinc.

Note.—The presence of iron, and its amount, may also be determined as follows: Dissolve the zinc in water with the aid of hydrochloric acid, oxidize any iron present by nitric acid, and add ammonia in excess. This throws down the iron in form of brown ferric hydrate. Collect this on a filter, wash with ammoniacal water, dry, and weigh.

The Standard Kilogramme.

MR. BERTRAND, perpetual secretary of the Academy of Sciences, reported at a recent meeting that the platinum and iridium alloy necessary for the thirty-six international standards has been received from the English firm of Matthey by the Metrical Weights and Measures Committee. The alloy proved to be chemically pure, and to consist of 9 parts of platinum and 1 of iridium, as ordered, but its physical properties left something to be desired, the specific gravity being slightly under the theoretical figures. Microscopical examination also showed the metal to be too loosely grained. In consequence, the alloy was submitted to repeated annealing and powerful hammering until the specific gravity exactly agreed with theory, and could no longer be increased by further treatment. The commission now consider their metal perfect, and will proceed to execute the standard weights to be distributed.—*After Chem. and Drugg.*

Best Method of Preparing Nitrogen for Demonstrations.

DR. CHARLES R. C. TICHBORNE states that he has for a long time used the following method of preparing nitrogen gas for lecture purposes:

Ten Gm. of ammonium sulphate and 10 Gm. of sodium nitrite are mixed in a capacious retort with 40 C.c. of glycerin and 60 C.c. of water. The retort should be of the capacity of half a liter, or about 16 ounces. The retort is placed with the neck elevated to an angle of about 40°, so that the water may condense and fall back into the retort. A bent tube is fitted with a cork into the neck, and conducts the gas into a wash bottle, or it may be collected at once for general purposes without washing.

One hundred C.c. of water may be used in place of the mixture of glycerin and water, but it does not seem to work quite so regularly. Heat is applied directly to the retort, and the disengagement of free nitrogen begins at a temperature a few degrees below the boiling point of water. It steadily but rapidly proceeds—the temperature generally rises a few degrees above the boiling point, but after a little time again begins to fall. A gentle but constant heat will, however, keep up the disengagement of gas until the nitrite is all decomposed. It is desirable to slightly increase the heat towards the end of the reaction.

There is nothing specially new in this process, except the substitution of the sulphate for the chloride, and in the determining of the exact conditions under which the experiment may be carried on successfully for class illustrations, or for the purpose of procuring pure nitrogen with the least expenditure of trouble. If the reaction is pushed on very rapidly, ammonia will be evolved, and this phenomenon is most marked when using the chloride in place of the sulphate. If carried on slowly with the sulphate, no ammonia is evolved, but a trace of nitrogen dioxide is produced, which may be easily removed by washing with a dilute solution of permanganate of potassium. By carefully regulating the temperature, almost pure and neutral nitrogen will be evolved.—*Chem. News.*

Chloride of Methyl Spray in Neuralgia.

SINCE Dr. Debove showed how valuable the spray of liquefied chloride of methyl gas was in the topical treatment of various neuralgias, the literature of the subject has grown considerably, and many cases of cure resulting from the application of the spray to the neuralgic area have been recorded. The gas, however, had to be liquefied by pressure, and the cylinders containing it were bulky and complicated. Galante et Fils, of Paris, have lately made for Dr. Debove (Feb., 1888) a small, portable cylinder which has brought the method into general use in France. The cylinder has a milled-headed screw at the bottom of the apparatus, by the turning of which a fine spray jets out from an aperture just above it. This spray can be regulated to a nicety by the screw. A correspondent, who has recently tested the method, reports that he has employed it in over fifty cases with the following result: "The action of the spray upon the skin is remarkable. Such intense cold is instantaneously developed that, directly the chloride of methyl touches the skin, the latter becomes hard, iced, white, and frozen. At the same time the patient feels as if he had been touched with a hot iron. Two seconds, or at the most five, are quite long enough for its application to any one patch of skin; for the skin will rapidly vesicate, and even become gangrenous, if the spray is continued for a longer period. It is better to play the spray *obliquely* over the skin, letting it glance off, rather than direct it straight at and in close proximity to the part. It has been used in France for extracting teeth painlessly, also in minor operations for local anaesthesia, and is recommended for trigeminal neuralgia. Concerning the last, I would at once dissuade others from using it upon the face, for the application leaves a most disfiguring brown coloration which takes a long time to fade. Of its value in the treatment of neuralgia there is no question. I have taken fifty cases of various neuralgias of the neck, back, testicle, urethra, and legs, and have relieved many temporarily and some permanently by its use. It is a rapid and effective vesicant, and has proved of value as a substitute for the often useful plan of 'firing' joints. As a 'moral' force in neuromimesis and malingering, it will doubtless be most persuasive."—*Lancet.*

Chlorate of Potassium as an Explosive.

CHLORATE of potassium is the most explosive substance with which chemists and druggists have to deal. By itself it seldom gives rise to serious accidents, but the violence of its character is occasionally shown, and most frequently and disastrously in the case of colored fireworks. We learn from a report of Her Majesty's Inspectors of Explosives that Mr. Dupré, the chemist to this department, last year had to investigate an accident in Pain's fireworks factory arising from the explosion of colored stars. The results are of interest as corroborating previous observations regarding the highly sensitive nature to percussion and friction of chlorate mixtures, particularly at slightly elevated temperatures. The chemicals em-

ployed in the manufacture of the stars were found to be chlorates of barium and potassium, nitrate of strontium, shellac, coal, and lamp-black. Lamp-black is liable to contain an appreciable quantity of free sulphuric acid, but there was none in this case. It was found, however, that one of the ingredients (Chertier's copper) of one of the stars was distinctly acid, and was the cause of the explosion. Chertier's copper is a mixture of chlorate of potassium and sulphate of copper, which has been moistened with ammonia and dried. When freshly made it is alkaline, but in time it loses ammonia, becomes acid, and evolves chlorine compounds, owing to the decomposition of the chlorate of potassium by the sulphate of copper. In other words, Chertier's copper is liable to spontaneous decomposition, and the presence of such a substance in a combustible or explosive mixture cannot but be highly dangerous. It is marvellous how little is required to produce "spontaneous" decomposition in these explosives. Thus the paste used for making pill-boxes becomes acid, owing to a change in the alum of the paste; and as no chlorate mixture should ever be brought into contact with materials that are either acid in themselves or are liable to become acid in the course of keeping, it is obvious that the spontaneous ignition of such mixtures kept in these boxes becomes merely a question of time and circumstances. These remarks apply more particularly to fireworks, but pharmacists will do well to keep the facts in mind when they are handling powders or other preparations containing chlorates.—*Chem. and Drugg.*

Dangerous Combustion Products from Chloroform.

A COMMUNICATION from Dr. Stowasser, reporting the occurrence of untoward symptoms during the administration of chloroform in a room where a gas flame was burning, apparently as a consequence of the formation of some noxious compound, has called forth several other notices to a similar effect (*Pharm. Zeit.*, April 6th, p. 221).

Professor Sterson, of Leyden, says that during last winter severe and sudden asphyxia occurred repeatedly in the operation room of a small, newly erected hospital where, on account of insufficient heating arrangements, the gas lamps were ignited on cold days. In one case even death resulted under conditions that he thinks inexplicable except by referring it to the combination of chloroform vapor with the combustion gases of the gas-lights. As soon as a larger stove was obtained and the burning of gas discontinued during operations, the chloroform narcosis became again normal. Dr. Fischer, of Carlsruhe, reports a case where, after a time, all present in the room were affected by an irrepressible tendency to cough, followed by sense of fullness in the head, headache, and even vomiting. The room appeared full of a whitish vapor, especially in the neighborhood of the gas-lamp. Dr. Hartmann, of Otterstein, also records a case where an odor of chlorine was noticed, and a tendency to cough was developed in all present, which was relieved upon the access of fresh air. The observation is not a new one, since, in a passage quoted from v. Langenbeck, there is a warning that operations by gas-light might become dangerous through the formation from the volatilized chloroform of the irrespirable chloro-carbonic acid.—*Pharm. Journ.*

Arsenical Glycerin.

THE statement made some time since that in Germany glycerin is met with containing arsenic has been confirmed, and, in addition, it has been alleged that, under the present conditions of manufacture in that country, all glycerin will contain more or less arsenic derived from the sulphuric acid used in its production. The necessity for the insertion in the German Pharmacopoeia of a test for arsenic in glycerin is therefore obvious, and one has been suggested by Dr. Vulpinus (*Apoth.-Zeit.*, April 10th, p. 390). It requires that paper moistened with a 50% solution of silver nitrate, when exposed to the hydrogen gas evolved upon adding zinc to a mixture of 2 C.c. of glycerin with 3 C.c. of official hydrochloric acid, should not within fifteen minutes show any yellow spots becoming black upon being moistened with water.—*Pharm. Journ.*

Remedy for Nasal Catarrh.

A solution which has been found to give better results than that known as Dobell's (*Liquor Sodii Boratis Compositus*, Nat. Form., No. 235), and which has proved to be very efficacious as a local application to the nasal membrane in acute nasal catarrh, is prepared in the following manner, according to the *Med. and Surg. Rep.*:

Sodium Bicarbonate.....	dr.	8
" Borate.....	"	8
" Benzoate.....	gr.	20
" Salicylate.....	"	20
Thymol.....	"	10
Eucalyptol.....	"	10
Menthol.....	"	5
Oil of Gaultheria.....	gtt.	6
Glycerin.....	fl. oz.	8½
Alcohol.....	"	2
Water.....	to make	" 16

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FREDERICK A. CASTLE, M.D. EDITOR.

CHARLES RICE, Ph.D. ASSOCIATE EDITOR.

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EDITORIAL.

So many and various programmes have been published for the guidance of prospective tourists who may intend going to the San Francisco meeting of the American Pharmaceutical Association, that it is to be hoped that measures may be taken to insure greater unanimity hereafter in the work of the committee of arrangements. It is unfortunate that dissensions should have occurred in regard to this particular matter, for it is liable to discourage the attendance of some who might otherwise have made this an occasion for visiting the Pacific coast. It is quite certain that the California members have prepared a most cordial reception, and that everything possible will be done by them to make the meeting enjoyable. It will, therefore, be a matter for much regret if anything which transpires on this side of the continent diminishes the number of guests.

We await with much interest the action of the American Medical Association with reference to the proposed exchange of delegations with the American Pharmaceutical Association.

The time seems to have arrived when concert of action should take place respecting questions of mutual interest to the two professions. Among the foremost of these is the revision of the Pharmacopoeia. Whatever may have been the feelings of former generations of physicians, the present seems to have little, if any, appreciation of the character of the Pharmacopoeia or of its importance as a standard. The majority of younger physicians have probably never seen the work, and are far more inclined to place their reliance upon the products of certain manufacturing firms than upon such as are to be found in the trade generally; and when we consider that the pamphlets and other advertisements of these firms are systematically, frequently, and persistently circulated gratuitously; that medical journals are constantly using their influence to promote the sale of proprietary articles, and that it is rarely that they ever refer to the importance of the Pharmacopoeia or to the articles contained in it, this condition of affairs is perhaps not surprising. We have had occasion to believe that a large proportion of the younger physicians think that the title pharmacopoeia is

only a synonym for one or another of the dispensatories, and, if they recognize any difference at all, are inclined to the opinion that a dispensatory is an authoritative work upon which the pharmacopoeia is a sort of commentary made by apothecaries for their own particular benefit, and that their motive in doing this is to enable them to furnish cheap drugs without being detected by doctors.

An otherwise intelligent physician, who was recently asked whether he had any interest in the forthcoming revision of the Pharmacopoeia, declared that he had not; that he much preferred the products of reliable manufacturers to pharmacopoeial preparations; and when asked to mention an instance which would justify his opinion, said that he had lately prescribed for a patient a solution of bisulphate of quinine, which had been prepared by a well-known pharmacist who was reputed to be skilful, and who was a graduate of a European school. The first time the solution was prepared it worked all right; but although the prescription was renewed several times thereafter, it had failed to produce cinchonism in his patient, and he had reason, he thought, to believe that the apothecary had substituted a weaker salt of quinine.

It is hardly necessary to say that it was not considered worth the trouble to continue the discussion further.

ANOTHER condition which helps to make matters worse is the fact that some teachers in medical colleges are in the habit of recommending in their lectures the use of proprietary articles, and of specifying the products of certain manufacturing pharmacists, and that in very few courses of lectures upon materia medica and therapeutics is any pains taken to inform students of the true nature of the Pharmacopoeia and its relation to the medicines in common use, or to the medical and pharmaceutical professions.

THERE is but one practical way for overcoming this want of general information respecting this important work, and that is by popularizing it and distributing it through the various State associations, so that a copy will be put into the hands of the majority of physicians throughout the country. The details of such a scheme will necessitate much study and will involve some expense, but in no other way does it seem possible to overcome the ignorance which seems now to exist regarding it, or to offset the influence of dispensatories and pamphlets issued for private gain.

A PHYSICIAN prescribed two drachms of Magendie's solution of morphine. It was dispensed by an apothecary in a two-ounce vial with a narrow neck, whereat the doctor called the apothecary bad names, and suggested to his patient that it might be advisable to take his prescriptions to another dispenser in the future.

Will some of our readers express an opinion as to what the matter was, and why the doctor was wroth, and why he recommended a change of patronage?

Obituary.

DR. CHARLES A. ROBBINS, son of the late Daniel C. Robbins, and member of the firm of McKesson & Robbins and of the New York Quinine and Chemical Works, died on May 4th, at his residence in Brooklyn, at the age of 34 years. He was a graduate of the College of Pharmacy (1873), and later went to Germany, where he studied chemistry and obtained the degree of Ph.D. He leaves a widow and two children.

CHARLES E. FOUGERA, who founded the firm of E. Fougere & Co., of New York, died at Brooklyn on April 22d, at the age of 68 years. He was a graduate of the University of Paris, and of the College of Pharmacy of the City of New York.

Salicylic Acid.—In order to detect the presence of meta- or para-oxybenzoic acid in salicylic acid (ortho-oxybenzoic acid), Professor L. D. Koninck recommends a method based upon the fact that salicylic acid volatilizes in the vapor of water (*Pharm. Zeit.*, April 6th, p. 222). A small quantity of the acid to be examined is reduced to a finely divided condition with water, and is then evaporated slowly to dryness in a porcelain dish. The acid should entirely volatilize; if there be any residue, it would indicate the presence of one or other of the isomers, or more probably a mixture of both.—*Pharm. Journ.*

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,320.—Botanical Material (Erie).

Botanical mounting paper, genus and species covers, and drying paper, such as is used by botanists, may be had, cut to proper or standard size, from A. L. Cassino, Naturalists' Agency, 196 Summer street, Boston, Mass.

No. 2,321.—Covering the Taste of Creosote (W. L. & Co.).

One of the most efficient agents for covering the taste of creosote is a concentrated decoction or extract of coffee. We should, however, not use the word "covering," for it is impossible to hide the taste or odor completely. It is only possible to modify it so that it will not leave a disagreeable taste of long duration in the mouth.

Another good method of administering it is suggested by one of our correspondents, who recommends each dose to be given in a little vanilla ice-cream.

No. 2,322.—Kola Nut and Kola Paste (C. F. D.).

After Thomas Christy, of London, had been instrumental in drawing the attention of the European medical world to the Kola nut (in his *New Commercial Plants*, No. 8, Lond., 1880), we published an illustrated article on the subject (in *NEW REMEDIES*, 1881, p. 34), in which the subject was treated at length, and where we also showed, by quotations from Clusius and other authorities, that Kola nuts have played an important part in the country of their growth for a long time past. Further contributions to our knowledge on the Kola nut, from various sources, will be found in this journal (*AMER. DRUGG.*), 1885, 5; 133. 1886, 155 (Kola paste). 1887, 75; 148. 1888, 163.

No. 2,323.—Preventing the Creeping of Salts (Ed. J.).

We are asked to state how the tendency of certain salts, when crystallizing from a solution, to gradually creep up along the sides of the vessel and to pass over the edge, may be prevented.

This may easily be accomplished by rubbing the inner side of the vessel, above the level of the liquid, with a little oil. But it should be applied sparingly. If the liquid is to be exposed for a long time, it is preferable to substitute a somewhat harder coating for the oil, the latter having, besides, the disadvantage that it will develop a rancid odor. A good mixture to apply (warm) is: vaseline 1 part, white wax 2 parts.

No. 2,324.—Cascara Sagrada (Junior).

Our correspondent has seen a note in a recent English pharmaceutical paper (evidently the *Pharm. Journ.*) in which the pronunciation of the word *cascara* was discussed. It was stated there that the first word should be pronounced *cáscara*, with the accent on the first syllable, since this is the way the Spanish *cascara* (bark) is actually pronounced.

In reply, we would say that the before-mentioned method of pronunciation is, indeed, the correct one. "Cascara" means not only bark, but is also employed as a name for a "bark canoe" in some parts of South America. However, the incorrect pronunciation *cascára*, with accent on the middle syllable, has become so general in this country that it is doubtful whether the correct one will take its place.

No. 2,325.—Soziodol (M. V.).

This is a compound derived from di-iodo-paraphenolsulphonic acid, patented by H. Trommsdorff, of Erfurt. As the acid itself is too little soluble, it is combined with various bases, such as sodium, potassium, ammonium, barium, lead, mercury, silver, zinc, etc., etc. By common consent of the manufacturer and the trade, the *sodium* salt is furnished when "soziodol" without further specification is ordered.

The chemical composition of the sodium salt is $\text{NaC}_6\text{H}_4(\text{OH})\text{SO}_3 \cdot 2\text{H}_2\text{O}$. Sometimes the sodium salt is designated by the term "soziodol, easily soluble," while the potassium salt is called "soziodol, difficultly soluble."

The salt is prepared from paraphenolsulphonate of potassium (paraphenolsulphonic acid is one of the products resulting from the action of concentrated sulphuric acid upon phenol) by dissolving this salt in an excess of diluted hydrochloric acid, and then adding a solution of iodide and iodate of potassium ($\text{KIO}_3 + 5\text{KI}$), or chloro-iodine, under constant stirring. The iodine, which at first separates, soon disappears, and the liquid solidifies, owing to the separation of white crystalline needles. These are pressed to remove mother-water and then recrystallized from boiling water. When pure, they represent the "difficultly soluble soziodol," or "potassium soziodol." By inter-reaction of this salt with chloride of barium, the corresponding barium salt is obtained. From this the free

di-iodo-paraphenolsulphonic acid may be liberated by decomposition with the calculated amount of sulphuric acid, and from the free acid the sodium salt finally prepared.

Soziodol-potassium is in form of colorless, prismatic crystals, soluble in 50 parts of water to an acid liquid which assumes a violet-blue tint with ferric chloride. On addition of fuming nitric acid, iodine is separated. Soziodol-sodium is also in form of colorless, prismatic prisms, requiring only 13 to 14 parts of water or glycerin for solution. The cold-saturated solution of either salt furnishes with nitrate of silver a white precipitate soluble in nitric acid (abs. of chlorides). A yellow precipitate would show the presence of iodides, though chlorides may then, of course, be also present. On adding to the aqueous solution of either salt some chloride of barium solution, the resulting precipitate must dissolve on boiling the liquid, showing absence of sulphate (Hirsch).

No. 2,326.—Hostetter's Bitters (C. S.).

The following formula was furnished to us some years ago by one of our correspondents. We are not sure whether it will produce a product identical with the genuine. Of course, the recipe of the latter is private property, and the owners are not likely to divulge it:

Calamus.....	2 lbs.
Orange Peel.....	2 "
Cinchona.....	2 "
Gentian.....	2 "
Colombo.....	2 "
Rhubarb.....	8 oz.
Cinnamon.....	4 "
Cloves.....	2 "
Diluted Alcohol.....	4 gall.
Water.....	2 "
Sugar.....	2 lbs.

Reduce the solids to powder and percolate with the diluted alcohol and water previously mixed; then dissolve the sugar in the percolate.

No. 2,327.—Chewing Gum (H. T. S.).

The manufacturers of chewing gum use different ingredients and in varying proportion. Spruce gum used to be one of the principal bases, but this was afterwards partly replaced by soft paraffin or by balsam of tolu. Afterwards, when gum chicle (balata) became better known in this country, this was found to be the most preferable base, and probably all chewing gum now made contains more or less of it. What proportion of these ingredients the commercial kinds of chewing gum contain is not known to us. This would have to be determined by a quantitative analysis, preceded by a careful study of the solubility of the constituents. As to the flavors used for chewing gum, we regret that we are unable to state the composition of those mentioned by our correspondent. Nor is any one else likely to know it except the manufacturer.

No. 2,328.—Silicate of Sodium (J. W. W.).

On page 78 of our last April number we published a formula for a "Fertilizer for House Plants," in which silicate of sodium was directed as one of the ingredients. Our correspondent used the viscid, jelly-like mass which, though soluble in water when fresh, yet soon absorbs carbonic acid gas from the air and sets free insoluble silicic acid. He asks our advice in the matter.

There is both a solid (or semi-solid) and a syrupy liquid "silicate of soda" in the market. The former is not suitable for preparing aqueous solutions, as it will always leave more or less insoluble residue. The latter kind, appearing like a clear, dense syrup, mixes freely and clear with water, and is the kind used by surgeons to make silicate dressings. We advise this to be used. It is manufactured by Feuchtwanger & Co., of New York, and probably also by others, and may be obtained through any wholesale drug house.

No. 2,329.—Chloroborite of Sodium (Newark).

A salt which Merck calls "chloroborite" of sodium was recommended some time ago by Dr. R. Rueger (at the Convention of German Naturalists at Cologne in 1888) as a food preservative and antizymotic, when used in the proportion of 1 part by weight of the salt to 200 parts of the substance to be preserved. Its antiseptic action is said to be caused by a slow, spontaneous elimination of chlorine from the salt. We doubt the latter statement, since the quantity of chlorine thus made available for every 200 parts of material would surely be too small to retard or arrest fermentative or putrefactive processes. It seems to us much more likely that the compound is merely a mixture of chloride of sodium and boric acid, perhaps with some borax. Of course this is merely conjecture, as we have not had an opportunity of examining it. But it seemed to us improbable that any preservative which could give off free chlorine would be suitable for articles of food.

No. 2,330.—Ehrlich's Test for Typhoid Urine (P. H. G.).

We have given this test before, but it is only of late that it has been more frequently quoted by the name of its discoverer, viz., as "Ehrlich's Test." It appears to have stood

the criticism of the profession thus far. The reagents necessary, and execution of the test, are as follows:

1. *Sulphanilic Acid*.—A saturated solution of this in dilute (1 in 20) hydrochloric acid.

2. *Nitrite of Sodium*.—A solution of 1 part of this salt in 200 parts of distilled water.

Both of these solutions should be fresh. At least the last-named should be so, as it cannot be kept many days without spoiling. When the solutions are mixed, sulphanilate of sodium and free nitrous acid is formed (with an excess of sulphanilic acid), and this is the real test solution wanted. But, owing to the extreme instability of the latter, it cannot be prepared for stock, but must be made fresh before every test or series of tests.

For use, mix

25 C.c. of the sulphanilic solution.
1 C.c. of the nitrite solution.

With this mix an equal volume of the urine to be examined, and then render it alkaline with ammonia.

According to the *Med. Record*, with normal urine the only change which ordinarily occurs is a mere deepening of its color to a sherry or vinegar brown. In conditions of pyrexia other than typhoid fever, the color also deepens, but still remains merely brown, although usually it becomes of a darker tint than the average color given by normal urines. But when the test is applied to the urine of a patient with enteric fever, the color rapidly turns red, the exact tint it acquires varying from the yellowish red of bichromate of potassium solution, through ruby red, to that of a rich port-wine color. On shaking the test tube, a froth is produced which has usually a delicate pink color that is characteristic. On allowing the mixture to stand twenty-four hours, the phosphates precipitated have an olive-green tinge.

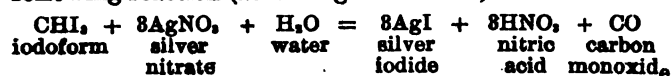
The *Med. Record* adds that Dr. Howard Taylor, in reporting his experience with this test, evidently is unaware of the importance of this olive-green precipitate.

No. 2,331.—Reaction between Iodoform and Nitrate of Silver. Caution! (N. & Co.).

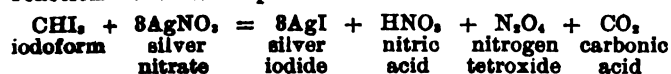
We are informed by our correspondents that, owing to careless packing and unusual jolting during conveyance, two contiguous bottles containing iodoform and nitrate of silver were broken in a box and the contents mixed, as became evident from a brisk escape of suffocating red fumes through the chinks and cracks of the box. The contents packed with the two bottles were utterly ruined, and so were a number of articles which were close to the box. The persons in charge, fearing that the box would take fire, drenched it with water, and the liquid soaking through the bottom of the conveyance corroded all metal parts it came in contact with. Our correspondents have ascertained, what they had been unaware of before, that iodoform and nitrate of silver exert a chemical action upon each other, but wish to have it explained.

The matter is very simple, *except* the explanation of the cause of the reaction or the manner of its beginning.

When iodoform is added to a solution of nitrate of silver, under trituration, or, better, if iodoform is gradually triturated with solution of nitrate of silver, there is no violent reaction visible, but the whole of that constituent which is not present in excess is decomposed, after the following reaction (according to Greshoff):



When there is, however, no water present, and the substances come into intimate contact in a *dry* condition, a very violent reaction starts either at once or after a short time. It is not impossible that a trace of moisture at the points where the two substances touch each other induces the reaction in the sense above expressed, though the space over which the reaction, *as such*, can extend must necessarily be very small. But the impetus once given by the minute and probably invisible first reaction, which, moreover, must develop some heat, is most likely the cause of its spreading suddenly, the heat becoming continually greater, and the whole reaction passing off almost like an explosion. In this case, where water is absent, the reaction which takes place is as follows:



The lesson to be learned from the above is, *never* to pack nitrate of silver and iodoform together in one box, so that the contents can become mixed if the bottles break.

Pharmacists are pretty well posted in these days as to explosive or otherwise dangerous combinations, though, of course, the younger generation always has to learn a good deal in this direction. But packers and shippers in wholesale houses need some instruction in this line likewise, else they might be induced sometimes to pack together, near each other, in *one* box, such cheerful companions as a package of chlorate of potassium, a package of saccharated pepsin, and a bottle of sulphuric acid. These combinations could be varied ad libitum, but we hope that every effort will be made to keep them as far apart as possible.

No. 2,332.—Prescription Difficulty (J. D. M.).

We are asked the following query:

How would you prepare the following prescription? Why does the phosphoric acid precipitate the quinine after the latter is dissolved in the tincture of iron?

℞ Quininae Sulphatis..... 3 ℥.
Strychninae Sulphatis..... gr. 1.
Ac. Phosphor. Dil.,
Tr. Ferri Chloridi..... 55 fl. ʒ 1.
Vin. Pepsini..... q. s. ad fl. ʒ 4.

If the quinine salt is dissolved in the phosphoric acid and the tincture then added, the mixture is clear.—

The first query, "Why does the phosphoric acid precipitate the quinine?" starts from the hypothesis that the precipitate *must* be all quinine. But this is not necessarily the case. In fact, we are quite sure that it consists of phosphate of iron as well as of quinine. The sulphate of quinine, having been dissolved in the tincture of iron, has exhausted or neutralized the free acid which the tincture always contains, and the resulting solution is quite concentrated. When dilute phosphoric acid is poured in, the result is that phosphate of iron and also most probably phosphate of quinine (as this salt is less soluble than the sulphate) are formed. Each molecule of precipitate is surrounded by a liquid which becomes capable of dissolving the precipitate only upon addition of more acid. When all the acid is finally added, and the mixture well stirred, solution will eventually take place.

If the quinine salt is dissolved in the phosphoric acid, and the tincture of iron then added, each molecule of precipitate is surrounded, particularly during the first period of the reaction, by a sufficiently acid liquid to cause its immediate resolution.

But whether the solution has been made in one way or another, it is impossible to dilute it, with water, wine, or other similar liquid, without causing the precipitation of a basic quinine (and perhaps also iron) salt. There is a peculiarity of certain quinine salts, among which is the phosphate, that their solutions will not stand dilution unless the proportion of acid is increased or another acid is added.

The trouble with the prescription is that there is not enough free acid available to keep the phosphates which are formed in solution. This can be shown in the following manner:

Mix the phosphoric acid and tincture of chloride of iron, then add enough wine of pepsin to make 34 fluidounces, and dissolve the sulphate of strychnine in this. Reduce a weighed quantity of sulphate of quinine to powder, transfer a small portion (say 20 grains at first, later less) to a glass mortar, triturate it with a few drops of the liquid to a paste, and gradually add the rest until the quinine is dissolved. Pour the solution into a graduate. Again put some quinine sulphate in the mortar and triturate as before. Continue this until the last portion is seen to dissolve with difficulty. It will thus be found that only about 14 drachms (instead of 2) will be able to form a permanently clear mixture. And if the whole of the sulphate of quinine is to be added, it will require the addition of a small quantity of dilute hydrochloric acid (about 10 to 15 minims) to produce complete solution. This need not be expected at once, but the mixture may be set aside after the addition of about 10 minims and stirring. If not clear in five minutes, a little more acid may be added.

No. 2,333.—Volumetric Sulphuric Acid.

Normal volumetric solution of sulphuric acid is of such a strength that one liter or 1,000 cubic centimeters of it contain exactly half a molecule of the so-called monohydrated acid (H₂SO₄; mol. m. 98), that is, 49 grammes. The exact strength is standardized upon a basis which is known to be obtainable of a uniform strength and pure condition. Such a basis is, for instance, pure bicarbonate of potassium, which is a salt in anhydrous crystals, and is found in commerce exceedingly uniform and quite pure. Or pure crystallized oxalic acid may be chosen as the base. Upon this an alkaline solution may be standardized, and upon the latter then the sulphuric acid.

We now turn to the special point contained in the query of our correspondent, who desires to prepare a stock of normal sulphuric acid, not for general use, but as a standard to be used for occasional control of the volumetric acid prepared in the usual manner. He has found that by deriving a volumetric solution from another, not directly, but through the intervention of one or two others, an exact agreement or correlation is very difficult to reach.

In reply we would say that the difficulty will probably disappear if he will pay attention to the following points (when great accuracy is required):

1. Note carefully the temperature at which your original solutions are made. It is, of course, assumed that all weighings were accurate and no loss incurred. Choose, for making the solutions, such a place, if possible, in which you are afterwards going to use them, and in which great changes of temperature do not occur.

2. Use the solutions at the same, or as nearly as possible at the same, temperature as when they were made. Also prepare and use the solution, upon which they are to be used, at the same temperature.

In many cases, indeed, it is of no great moment whether the temperature varies a little. But when two solutions are to be used together in one operation, a disregard of temperature may introduce a material error.

3. Assure yourself of the correctness of your weights and of your burettes. In the case of the latter, at least be sure that, if you use more than one, they agree among each other in calibration. If they do not, allowance must be made. Or try and get along with one burette (which is, however, not always practicable).

Now, regarding a method of preparing an exactly correct normal sulphuric acid, there is, of course, only one way, and that is to determine its strength gravimetrically. Yet even here some precautions are necessary to avoid errors. Since a great deal of attention has been paid to this matter by public analysts, for the purpose of introducing uniformity in results, we can do no better than to quote here the method recommended last year by Dr. Wollny to the commission of the German Dairy Union (after *Chem. News*, 1889, 20):

A clean, dry dropping-bottle of about 60 Gm. content, the tip of which is touched with vaseline on the outside, is carefully weighed; 35 to 40 Gm. of normal [or approximately normal] sulphuric acid are then placed in it, and it is again weighed. Afterwards five portions of about 3 Gm. each are weighed in beaker glasses of 300 C.c. capacity. The drop-bottle being weighed after each portion, the exact weight of the sulphuric acid each time withdrawn is determined. One hundred C.c. of recently boiled distilled water are added to each of the portions. One hundred C.c. of this distilled water must not require more than 2 drops of [decinormal] barium solution [solution of baryta] to give color after 1 C.c. of phenolphthalein solution [1 in 30] has been added. The series of five samples is now heated in a water-bath to the boiling point, and to each as many C.c. of dilute barium-chloride solution, containing 15 Gm. of the salt in 1 liter, added that for each gramme of normal sulphuric acid there are present 10 C.c. of the barium-chloride solution. [For this reason the sulphuric acid should be as near normal as it is possible to make it by volumetric means.—Ed. A.M. Dr.] Afterwards the beakers are covered with watch-glasses and allowed to stand for fifteen minutes over the water-bath. The precipitates are then collected upon ash-free filters [Schleicher and Schüll's chemically pure filters, extracted with hydrochloric and hydrofluoric acids] of nine centimeters diameter, and washed with hot distilled water until the chlorine reaction disappears. After drying and incinerating, the weight of sulphate of barium yields by simple calculation the quantity of monohydrated sulphuric acid (H_2SO_4) corresponding to it.

We have given the text of the original somewhat modified in language, but unaltered in facts. But we have taken no account of a second set of samples which are to be tested by titration, since the gravimetric results, if concordant, are all-sufficient.

No. 2,334.—Pycnometer and Areometer (X.).

One of our friends recently consulted us regarding the proper use of the term *pycnometer*. Its general application to an instrument for determining specific gravity is, of course, beyond dispute. But some writers use the word *pycnometer* in the sense of "hydrometer" or "areometer," while others use it as a synonym of "specific-gravity bottle." Dunglison, for instance, says that a *pycnometer* is an areometer. Now, the term areometer (which should properly be spelled *arsometer*) was originally applied by Wolf, its inventor, in 1708, to a floating cylinder, such as we more generally call hydrometer. Hence Dunglison believes *pycnometer* to be a synonym of hydrometer. Without quoting other writers who have used the word in this sense, we may say that we had no difficulty in showing that the large majority of authorities use the word *pycnometer* distinctively as a synonym of "specific-gravity bottle," and never in the sense of "hydrometer." Moreover, we found that the word "*pycnometer*" was coined and introduced by Frederking (in 1836) specifically for denoting a thousand-grain specific-gravity bottle, being a bottle having a fine hole bored into it below the neck so as to permit an exact filling. (*Repert. f. d. Pharmacie* [Buchner], vol. 66, p. 73.)

No. 2,335.—Artificial and Natural Carlsbad Salt (S.).

The question whether there is any sound legal basis under the claim of the owners or agents of natural Carlsbad salt, that it is protected by proprietary rights, is one which belongs before the courts, and cannot be decided by us off-hand.

In reply to another portion of our correspondent's query, as to whether the natural and the artificial salt are equivalent to each other in composition, we can do no better than to quote from the last-issued number of the excellent *Handbuch der praktische Pharmacie*, by Beckurts and Hirsch (8th, Berlin, 1889, vol. II., pg. 407), the chapter (No. 1353) treating of this subject:

"The high price of the so-called natural Carlsbad salt, together with the low commercial value of the soluble salts contained therein, and the facility of imitating it, upon the basis of the existing analyses of the natural water, have for a long time caused the preparation of artificial saline mixtures in place of the natural salt. The em-

ployment of these artificial saline mixtures, and the fact of their being preferred to the natural salt, appears so much the more justified as the latter is not at all constant in its composition, and does not correspond, in constituents, to the natural water of the springs.

"The so-called *natural Carlsbad salt* (Sprudel-salt) consists of Glauber's salt (sodium sulphate) with more or less (but always very small quantities) of sodium chloride and carbonate. It differs, therefore, materially from the residue which is obtained by evaporating the natural Carlsbad water, redissolving the residue in water, filtration, and renewed evaporation. [The author designates by 'so-called natural Carlsbad salt' the article prepared at Carlsbad from the natural spring water.—Ed. A.M. Dr.] The reason of this difference is that, for the purpose of obtaining a handsomely crystallized salt, the natural water is allowed to crystallize during the cold winter, whereby the more difficultly soluble sodium sulphate is principally separated, while chloride and carbonate of sodium remain in the mother-liquid, except a small portion which accompanies the crystallized salt, unless the latter is freed from mother-liquid by washing. More recently a more rationally prepared salt has appeared in the market. This is called 'Karlsbader Quellsalz' (Carlsbad Spring-Salt), and contains the full amount of all constituents of the 'Sprudel,' which are soluble in pure water. It is twice as strong as the so-called Sprudel-salt, since it contains no water of crystallization, which in the Sprudel-salt amounts to 56 per cent. To prepare the 'Spring-Salt,' the natural water is raised to a boil, then filtered, and evaporated to dryness. The resulting neutral, saline mass, which contains sodium carbonate, is saturated with carbonic acid gas, whereby the carbonate is converted into bicarbonate. The product has the following composition:

Sodium Bicarbonate.....	35.95
Lithium Bicarbonate.....	0.89
Sodium Sulphate.....	42.05
Potassium Sulphate.....	3.35
Sodium Chloride.....	18.16
Sodium Fluoride.....	0.09
Sodium Borate.....	0.07
	99.96

"It is a white, granular powder, forming with water an almost clear solution.

"The German Pharmacopoeia does not recognize the usual crystalline form of the Sprudel-salt, because the preparation of this is incompatible with a homogeneous product. It gives, therefore, the following formula:

Sodium Sulphate, dry, in fine powder.....	44 parts.
Potassium Sulphate, in fine powder.....	2 parts.
Sodium Chloride, in fine powder.....	18 parts.
Sodium Bicarbonate, in fine powder.....	36 parts.

100

which are to be mixed. The mixture is a white, dry powder, containing the soluble constituents of the natural water in nearly the true proportion.

"Following are the mean results of the analysis of the natural water by Berzelius and Ragsky:

	Berzelius.	Ragsky.	Mean, reduced to per cent.
Potassium sulphate . . .	9.331	16.359	2.00
Sodium sulphate, dry ...	251.094	237.187	46.95
Sodium chloride.....	108.841	103.067	17.43
Sodium carbonate, dry...	181.927	136.189	35.60*
	496.193	492.803	101.98

* This is bicarbonate. The corresponding quantity of carbonate would have been 22.463.

"With the figures in the third column the proportions of the German Pharmacopoeia agree very well; so also the statement contained in this work, that 6 Gm. of the salt, dissolved in 1 liter of water, furnish a product similar to Carlsbad water."

The Use of Beer Yeast in Medicine.—The use of beer yeast in medicine has chiefly been confined to external applications. But from the account sent home by Dr. Herr from Algiers it would seem to be capable of internal use and with good results. He states that he has employed it with great success for the cure of scurvy. The doses were from one to three grammes for children under three years, from six to eight grammes for adults, to be taken every two hours. He also obtained good results in the treatment of purpura, dysentery, tuberculosis, and particularly in diphtheria.—*Chem. and Drugg.*

Oxygen in Asphyxia.—From April 1st, 1889, Paris fire men will be provided with cylinders of oxygen under pressure, to be used for the prompt relief of persons suffocated during fires. The oxygen will be added to the regular supply of medicines always at hand in case of accidents.—*Chem. and Drugg.*

Cement for Celluloid.—According to the *Neueste Erfindungen und Erfahrungen*, glacial acetic acid may be used for cementing celluloid. The fractured surfaces are to be moistened with it, and then pressed together for some time.

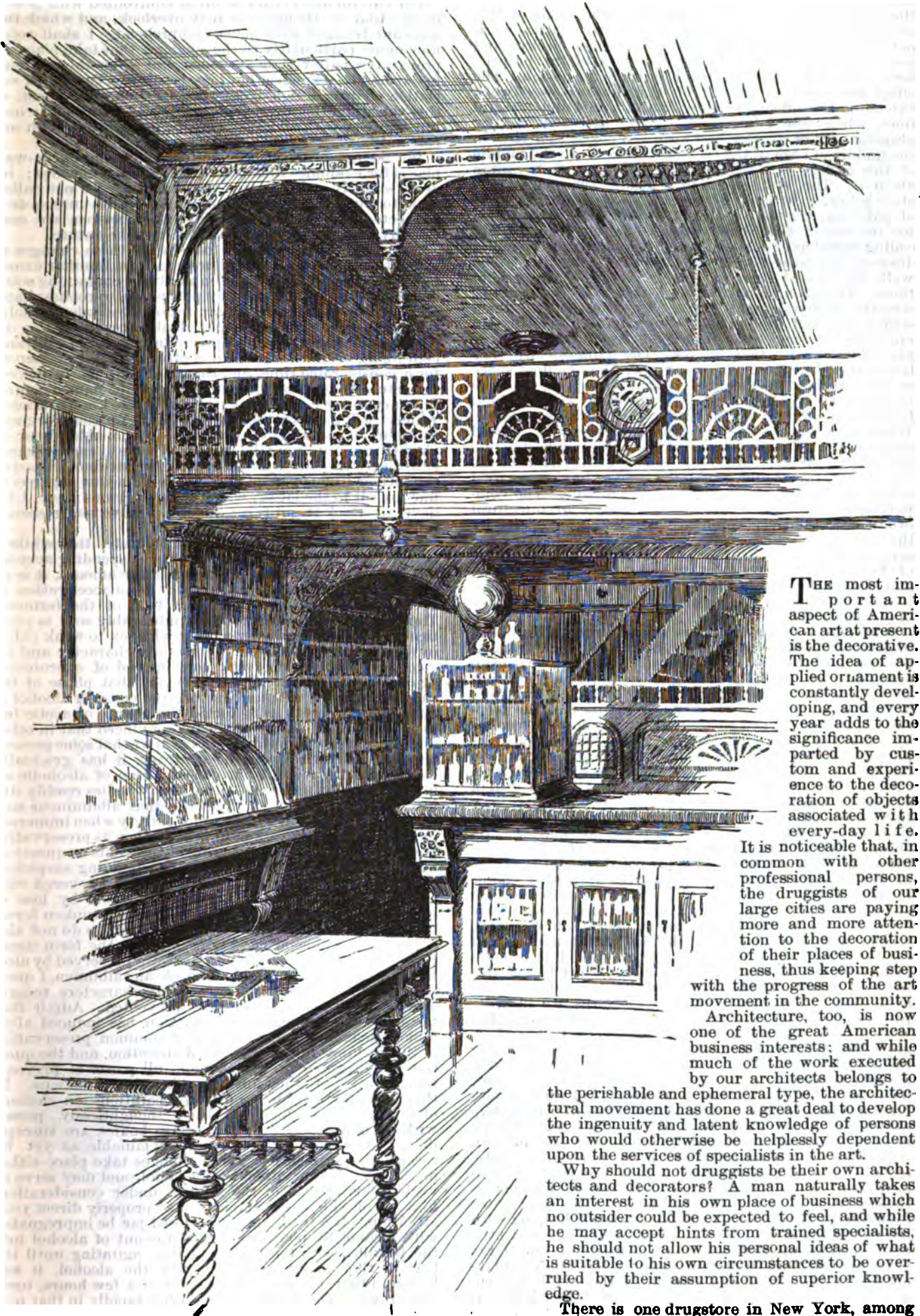
American Druggist

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Whole No. 181.

DRUG STORE ARCHITECTURE AND DECORATION.



THE most important aspect of American art at present is the decorative. The idea of applied ornament is constantly developing, and every year adds to the significance imparted by custom and experience to the decoration of objects associated with every-day life.

It is noticeable that, in common with other professional persons, the druggists of our large cities are paying more and more attention to the decoration of their places of business, thus keeping step with the progress of the art movement in the community.

Architecture, too, is now one of the great American business interests; and while much of the work executed by our architects belongs to

the perishable and ephemeral type, the architectural movement has done a great deal to develop the ingenuity and latent knowledge of persons who would otherwise be helplessly dependent upon the services of specialists in the art.

Why should not druggists be their own architects and decorators? A man naturally takes an interest in his own place of business which no outsider could be expected to feel, and while he may accept hints from trained specialists, he should not allow his personal ideas of what is suitable to his own circumstances to be overruled by their assumption of superior knowledge.

There is one drugstore in New York, among several which have been established under the

influence of the new decorative tendencies, in which the proprietor has successfully acted as his own architect and decorator, knowing exactly what he wanted and carrying out his ideas to suit himself. He has taken an ordinary three-story high-stoop corner dwelling, has reserved the upper part for his residence, and remodelled the lower stories into a conveniently arranged and compact store. By raising the floor he has gained fourteen feet of space in the basement, which he now uses as a laboratory and store-room. Behind the store is a small room devoted to prac-

tical matters, a staircase which leads to the clerk's room, a narrow hallway connecting with the dwelling space of the building, and an air-shaft which pierces the house to the roof and ventilates the store. The scheme of the store itself has been skilfully planned and tastefully executed. The woodwork, which is the most prominent feature of the decorations, is in light red-brown mahogany, designed, carved, and polished on the premises. The prescription counter is hidden by a screen of heavy cut glass in panels, and a gate designed with oblique forms, in imitation of a rustic one, leads on either side to the rear of the store, above which is a gallery. The front of this gallery is designed in a simple but effective lattice-work pattern, in which the round arch forms, circles, and scrolls are prominent. This is the work of the proprietor's wife, and shows a natural aptitude for design. The effect presented by this sweep of red-brown woodwork extending from floor to ceiling, with its neat and graceful lines, when viewed from the front of the store, is very pleasing both as to color and form. A colored jar rises in the middle of each of the two open arches. In the middle of this gallery is a rectangular opening with a railing about it. This is intended to ventilate the rear of the store below. The ceiling is not of the red mahogany but of pale oak, very handsome in its simplicity, the reason for the use of the lighter wood being that a mahogany ceiling would have darkened the store unduly. The many drawers and cases have simple, solid brass handles. The walls are treated in mastic color with scroll-like corrugations. The ground is divided at intervals by vertical wreaths of cherries and leaves. The frieze is light green with festoons of grapes and pomegranates above it. On one side the wall space is broken by clusters of large pink flowers with their leaves. The windows are very large; the store being a corner one, the window space would naturally be extensive, but, as it happens, the store front has been planned to give an unusually wide and high frontage of glass with as little woodwork as possible. Whatever there is of the red-brown mahogany, treated very simply. The top is divided into three compartments. The middle one has for its sole ornament the name of the druggist in raised and graduated gold letters on an oval relief, the largest letters being in the middle. The compartments over the windows have simple architectural ornaments, and the scheme of decoration is completed by the gilt mortar and pestle, with the eagle bearing the same symbol in his beak, which projects from the corner of the building. Altogether, this façade is very effective, and the whole store presents a good example of consistent architecture and decoration based on the adaptability of means to ends.

A basement drugstore offers rather a difficult problem of decoration, because it is inclined to be dark from its position, and the idea of sufficient light must be considered first of all in planning a commercial interior. There is a very prettily and cleverly arranged drugstore at New York which offers a capital solution of the decorative problem applied to basements. The store is reached by a flight of steps, and the door, which is rather wide, is flanked by two wide, low windows. The ceiling is low, too low to admit of any dark or elaborate scheme of decoration. The corner is one which receives a great deal of sunlight from its position on a wide, open avenue. For this reason the decorator was forced to select a combination of colors which should be light yet not glaring. He chose whites and pale tints of a neutral sort. This decorator was evidently an Italian. At the threshold is a large mosaic in grays and whites, bearing the proprietor's name in large letters. The floor is paved with white marble, and white marble of fine quality carved in simple, slightly curved forms is used for the casing of the side counters, which, in this drugstore, are divided in the middle, and for the prescription desk at the rear. The desk is completely hidden by a high marble slab. The effect of this mass of white marble, illumined by the sun, is quite sumptuous. The wall casings and shelves are in white painted wood with mirrors in the panels that separate the wall spaces. The walls are painted a very pale yellow-green with a stencilled ornament of darker hues accenting them at the top. The ceiling is in pale lavender with pinkish borderings at either end, and bunches of roses, palms, and ferns, a garland of roses around each slender brass gas fixture, and birds and butterflies in bright, delicate colors dotted about as if flying. This sort of work belongs to the old-fashioned Italian school, and modern American decorators repudiate it as representing false tendencies in art, on the ground that only conventionalized forms should be employed in decoration, but, nevertheless, it is pleasing and attractive. The soda-water fountain, in red and gray marble, is out of keeping with the rest of the store. It should be in white or pale tinted marble. The window decoration consists of four large brass rods starting from each corner of the window, making a long, low curve, and meeting in the middle to form a rest for 2 large, squat, fat bottles. One of these bottles is blue, the other yellow. Both colors and forms are too strong and heavy for the delicacy of the rest of the decorations. The windows being low and broad, it is permissible to have low bottles hung low, but both these and the supporting rods should be of a lighter and more graceful

character. The chairs, with their dark velvet seats and walnut frames, are too heavy. Light wooden chairs painted in white, with pale flowered designs in the upholstery, are the proper accompaniments of this scheme of decoration.

(To be continued.)

Uncertain Medicines.*

BY J. U. LLOYD, CINCINNATI, O.

THE careful apothecary is often confronted with possibilities that the thoughtless may overlook, and which the ignorant druggist may never comprehend. I shall refer now more particularly to the changes that take place in preparations after they are made and while they remain in our hands—changes that may result in a continued variation of drug action from time to time. By reason of this variation, the physiological force of many medicines must surely, with all physicians, be more or less of an uncertainty.

We do not necessarily have to seek in out-of-the-way places for examples illustrative of the foregoing idea: indeed, scarcely a day passes that the writer is not called upon to study the matter in one or more of its unrecorded, connected phases, and probably other persons are continually confronted with problems of a like nature.

There are various known causes for these changes in properties of pharmaceutical preparations, familiar examples being the action of light on mixtures containing some compounds of iron, especially phosphate, pyrophosphate, and citrate; the slow disorganization of alkaloidal solutions (elixirs, perhaps) of slight alkaline reaction; the decomposition and subsequent precipitation of acid solutions containing bismuth salts, which often remain transparent for a considerable time, and then suddenly fly to pieces, etc., etc. These familiar examples may be named as preliminary to the consideration of others less known, among which I will mention the action of light on many organic solutions exposed thereto, and the questionable power of alcohol in maintaining the medicinal force of some organic substances that are soluble in that menstruum. Passing the former (influences of light), I will in this paper confine myself to the latter, which many persons have, I believe, overlooked entirely; indeed, I have never seen a reference thereto.

By way of a comparison, it may be stated that while it is true that alcohol has the power of suspending acetous fermentation when the alcohol is in large amount, it is no less true that in smaller amount it is an acceleration of such fermentation, being then a food of the ferment. Thus vinegar of a quality that is unbearably sour is practically made by gradually adding whiskey to weak cider, in which case the alcohol reverses its character and becomes a producer of acetic acid instead of a protector against acetification. Pass, however, that phase of the subject, which is well understood, and consider alcohol in quantities so great as to forbid the chance of acetic fermentation, and I am by no means convinced that in other directions it is the uniform preservative that some persons believe it to be. Upon the contrary, it has gradually dawned on my mind, from consideration of alcoholic solutions of many substances, that many bodies readily disintegrate in its presence. True it is that albuminous substances are coagulated and cannot putrefy when immersed in alcohol, this illustration being typical of its preservative power and an example that probably prevents us questioning its power in other directions, by quieting suspicion. If the brain of a man be placed in a jar and covered with alcohol, it becomes hard, brittle, contracts by loss of water, and is indefinitely preserved in its shrunken form; but even here I question if structural changes do not also occur to alter normal conditions. While the form structures of most anatomical specimens are preserved by alcohol by reason of its action on muscle and albumen, I question if their normal interstructural characters remain intact, even though putridity is prevented. Admit that the spirit has prevented putrefaction, has induced albuminous coagulation and acted as a common preservative in this instance in this prominent direction, and the question remains unanswered as to its full power of preventing alteration of other substances in other directions. In this field there may be, in plant preparations, an element of uncertainty which we have thoughtlessly passed without a question. Many organic bodies are susceptible of alterations that are not explainable as yet by recorded experiments. These changes take place either in the presence or absence of alcohol, and may serve as visible illustrations of the subject under consideration, to a few of which as examples I may properly direct your attention. If a fresh herb in a closed jar be impregnated with alcohol by pouring a small amount of alcohol into the jar filled with the herb, and then agitating until the herb is thoroughly saturated with the alcohol, it will be found that it loses its green color in a few hours, turning brown. The chlorophyll perishes rapidly in that part of the plant above the surface of the alcohol, while that beneath its surface sometimes remains green a considerable time, imparting its chlorophyll to the alcohol. Instead

* Read at the meeting of the Ohio Pharmaceutical Association, Mansfield, 1889, and kindly contributed by author.

of preserving the chlorophyl in the part of the plant above the liquid, the alcohol with which the plant is saturated hastens its decomposition, and a parallel experiment with a like jar of herb without alcohol shows that it will retain its green color long after the specimen saturated with alcohol has become brown or yellowish-brown.

This experiment is easily performed, and will illustrate the fact that, under certain conditions, plant constituents dissociate with increased rapidity in the presence of alcohol, which becomes then an accelerator of decomposition, and what is shown by the seen, may perhaps indicate what occurs at the same time, in other constituents of that plant structure, with the unseen. It is more than likely that simultaneous dissociations at the same time take place in other plant constituents; indeed, from my present view, there is no question on this point. Make a tincture of a fresh herb by covering it with alcohol, macerating it a short period, and quickly filtering. The tincture will at first be of a rich green. Place it aside; examination from time to time will show a gradual change to brown, and at last the green color often disappears entirely, a red-brown liquid usually being the result. (See note 1.)

It may be argued by some persons that in this instance the destruction of chlorophyl is immaterial, since chlorophyl is of no medicinal value. Accepting this view, we may, however, use the striking exhibition of alteration in color thus showing destruction of chlorophyl to permit us to question as to whether at the same time *unseen* dissociations may not be taking place in other directions, and we thus may be induced to make comparisons of the results of continued investigations which, formulated into a whole, become of service.

Pass from fresh plants to those that are dry—for many persons will refuse to accept as medicines other than those made from dry drugs. The precipitates that occur in tinctures and fluid extracts in the presence of an abundance of alcohol illustrate the fact that changes of some description are continually taking place in them. (Note 2.)

The sudden decomposition of fluid extract of *Geranium maculatum*, the complete disintegration of fluid extracts of *Stillingia*, *Iris versicolor*, *Epigaea repens*, and many others, whereby nearly all of the soluble solid constituents precipitate, indicate that alcohol fails to preserve these liquids from alteration. That these changes are of a chemical nature is indicated by the

material after decomposition is possessed of former characteristic properties. Neither the insipid serum that suspends it nor any other menstruum will redissolve this precipitate. The gelatinization of tinctures of kino and catechu



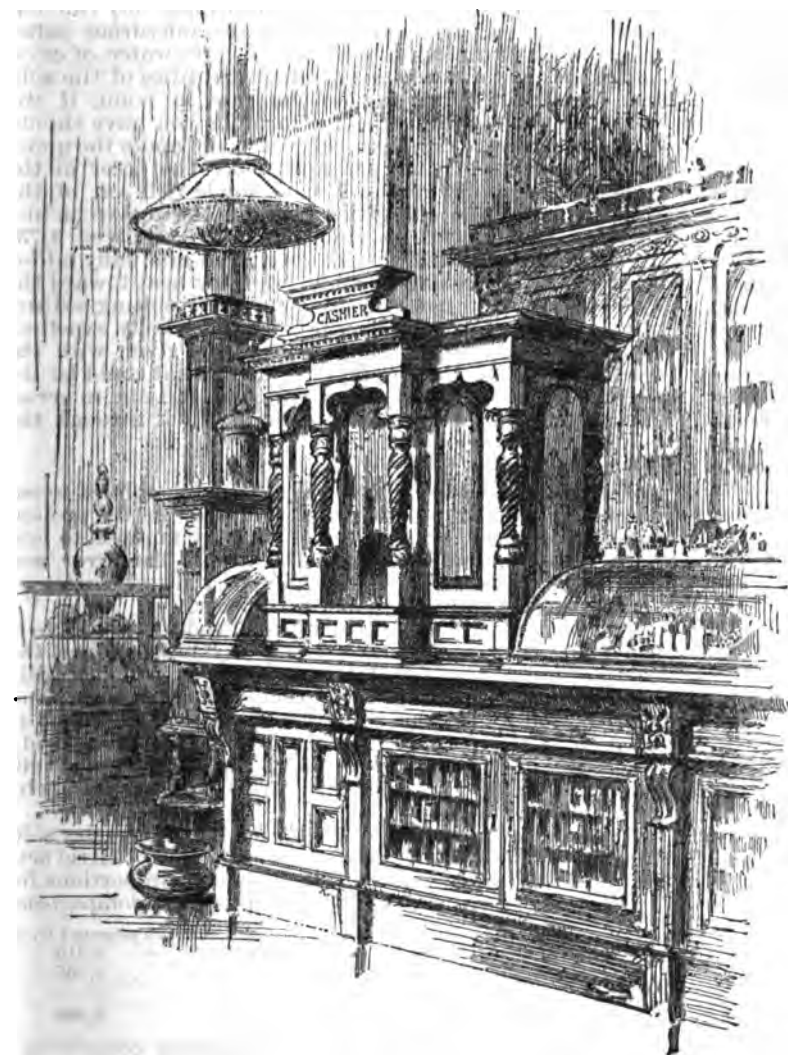
End of dispensing counter. (See page 121.)

is familiar to all persons, and, as we consider the subject in its familiar phases, the lesson seems to be: interstructural alterations that ordinary amounts of alcohol fail to interrupt are often in constant process, and these alterations may even continue to the utter destruction of the natural association of the educts originally held by the alcoholic liquid.

We have so far considered only the alterations that *visibly* affect a plant solution, and these have been cited as examples because they unmistakably illustrate what may take place in other directions in which the appearance of the liquid is not altered. Reasoning from the facts deduced from a study of the visible known, it is probable that unseen changes fully as important may be occurring in other directions. Indeed, there is every reason to infer that rearrangements of integral constituents may be continually at work in many alcoholic liquids, the result often being the production of new *soluble* bodies. Owing to the fact that there are no chemical tests for the majority of fluid extracts, these conditions can now only be determined by sensible methods. A fluid extract might become dismembered, so far as its original organization is concerned, and this fact remain hidden from observation if the resultant products are of the same color and soluble in the same menstruum. Indeed, I am sure that many substances do thus disappear in the presence of even strong alcohol. Of course the highly developed alkaloids are not liable to undergo much alteration, if any, but many very potent medicinal agents surely disappear entirely. Indian turnip covered with alcohol becomes insipid (Note 3); alcohol will not preserve its acrid principle. Tincture of *Rhus toxicodendron*, intensely poisonous when first made (Note 4), gradually loses its virulence and at last is practically worthless. Tincture of *Anemone pulsatilla* loses its anemonin rapidly and should never be carried over a season. Even a pure solution of anemonin in official alcohol disintegrates rapidly; it cannot be preserved. Other examples might be cited to show that active principles of plants are not altogether protected from change by alcohol, and after considerable attention in this direction I have concluded that we may well study alterations in alcoholic plant preparations with more than

usual profit.

To sum up: In my opinion, any cause for uncertainty in the physiological power of a pharmaceutical preparation demands the attention and investigation of apothecaries.



Cashier's desk. (See page 121.)

fact that a stringency of the liquid then disappears, while the resultant magma is free from astringency with *geranium*, *stillingia*, *iris*, and others, and no part of the entire

caries and pharmacists. Alterations that occur in these preparations render the practice of medicine proportionately uncertain. Only by studious attention in the direction indicated in this paper can we hope to determine the extent of such alterations, and these studies with many preparations *must* be made before we can expect to correct the matter. In order to aid the physician, whose skill in diagnosing disease is valueless without uniformly active remedies to meet symptoms of disease expression, we must consider the foregoing subject in connection with others that also render remedies uncertain.

Finally, I must conclude that while physicians have much with which to contend from variation of medicinal power of many of the fluids that are made from different qualities of drugs and by different applications of skill in working the same, in some important cases they also have to contend with liquids that are reliable when first made, but become worthless through age, regardless of the skill and care of the operator. In most cases these liquids are dispensed in full faith of their reliability, by reason of the confidence we have in the preservative power of alcohol.

NOTE 1.—The presence of water derived from the herb must not be overlooked in this instance. However, the large amount of alcohol present does not act as a preservative.

NOTE 2.—I do not overlook the phase of the subject contributed to the American Pharmaceutical Association in a series of papers some years ago, entitled, "Precipitates in Fluid Extracts," in which it was shown that natural laws necessarily produce many precipitates that are not dependent on any chemical alteration of plant constituents.

NOTE 3.—Alcohol, as shown by Prof. Maisch, will not dissolve its acrid constituents.

NOTE 4.—I make several barrels of this tincture each year at the proper season, from fresh herb, because the dry drug is worthless, using strong pressure and alcohol enough to make a very strong product. Each succeeding year I expect to throw into the drug-still a large amount of this tincture, to replace with new crop.

Ammonium Chloride.*

BY MARY H. SPENZER, CLEVELAND, OHIO.

SINCE granular ammonium chloride is not infrequently prepared from the crude sal ammoniac, impurities existing in the latter are more or less liable to be found in the finished product; but their presence there cannot class them as adulterants. Sulphate of ammonium and chloride of sodium seem to be the more common sophistications, while empyreumatic substances, aniline, sulphate of calcium, cyanide of ammonium, sulpho-cyanide of ammonium, lead, copper, iron, zinc, lime, barium, etc., are sometimes present as impurities.

Ammonium nitrite, which Storer ("Dammer's Lexikon," page 16) has noticed in old solutions of ammonium chloride, and which is due to the presence of lower forms of plant life, is detected first by acidulating the aqueous solution with sulphuric acid and testing with metaphenylene-diamine, with which nitrites produce from a yellow to a brown coloration.

Empyreumatic substances leave a dark residue after mixing the chloride with nitric acid and evaporating to dryness.

For the detection of the other impurities their several well-known tests were applied with results as shown by the schedule, and from which it will be seen that copper, zinc, iron, empyreumatic substances, sulphate of soda, and sulphate of calcium were detected in some of the samples.

Copper was present in but traces in specimens number three and four; zinc in number eleven in similar quantity; while iron, being present in the form of ferrous chloride, did not detract anything from the white condition of the sample, in contradistinction to the yellow ferric chloride.

No traces were found of chloride of sodium, cyanides, sulpho-cyanides, nitrites, lead, or barium.

The specimens were procured in Boston, New York, Cincinnati, Columbus, and Cleveland.

	Sulphate of Sodium.	Sulphate of Calcium.	Sulphates (in general).	Iron.	Empyreumatic Substances.
1	Trace.	Faint trace.	Trace.	Trace.	Trace.
2	None.	None.	None.	None.	None.
3	"	"	"	"	Trace.
4	Some.	Faint trace.	Some.	"	"
5	None.	None.	None.	Trace.	None.
6	"	"	"	None.	Some.
7	Trace.	Faint trace.	Trace.	Trace.	Trace.
8	None.	"	Faint trace.	"	None.
9	Some.	"	Some.	"	None.
10	None.	None.	None.	None.	"
11	Some.	"	Some.	Some.	Some.
12	"	"	"	None.	None.
13	None.	"	None.	"	"
14	"	"	"	Trace.	Trace.
15	"	"	"	Some.	Some.
16	Trace.	"	Trace.	None.	"

* Read at the meeting of the Ohio Pharmaceutical Association in answer to Query No. 76: What are the Impurities of Granular Ammonium Chloride of the market?

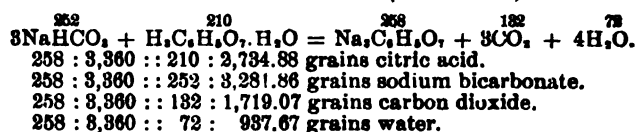
[ORIGINAL COMMUNICATION.]

TINCTURE OF CITRO-CHLORIDE OF IRON.

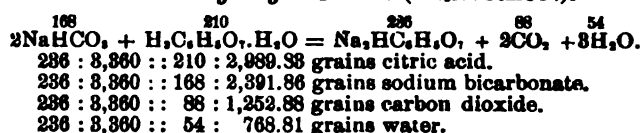
BY F. B. WELLS, PH.G.

I HAD occasion to renew my supply of tincture of citro-chloride of iron (N. F.) shortly after reading your article on page 100 of the May number. I thought the suggestion to make an extemporaneous solution of citrate of sodium an excellent one. At the same time it struck me that the cost when made in that way would be nearly as great as when the dry sodium citrate is used (quite an anomalous condition in the price of such chemicals); also, I could not see how a product measuring only 16 fl. oz. could be obtained, without evaporation, by using "sodium bicarbonate, 2,280 grains; citric acid, 4,160 grains; water, 7 fl. oz.," in addition to 4 fl. oz. sol. chloride iron and 2½ fl. oz. alcohol; lastly, I thought the quantities of the citric acid and sodium bicarbonate wrong. I calculate the quantities of acid and bicarbonate to make the three citrates of sodium as follows, each calculated to make 7 troy ounces:

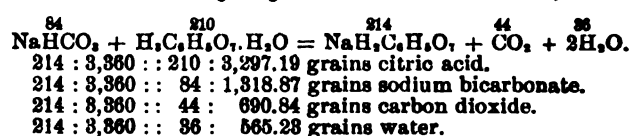
Neutral Sodium Citrate (Na₃C₆H₅O₇).



Di-Sodium Hydrogen Citrate (Na₂H.C₆H₅O₇).



Sodium Di-Hydrogen Citrate (NaH₂C₆H₅O₇).



In these calculations, I make no allowances for impurities of materials, which would be slight, nor for water of crystallization, which might make a great difference in the amount of the chemicals required; but I do not find the complete formulas of the several citrates in the books at my command, and I am obliged to make my calculations, assuming that all of them are anhydrous salts. If any or all of the citrates of sodium have water of crystallization, it would require smaller quantities of the acid and alkali; applying this to the case in point, if the citrate of sodium formed in the formula you gave should have any water of crystallization, it would make the quantities still greater, and, perhaps, make the error in the proportions equally great. I have made 16 fl. oz. of the tincture, using the quantities given in the above calculation for the neutral sodium citrate. I dissolved 2,735 grains citric acid in 5 fl. oz. water, and gradually added 3,282 grains sodium bicarbonate, applying heat toward the last to expel the gas and to keep the resulting sodium citrate in solution. When the gas was wholly expelled, I proceeded according to the directions given with the formula. To me the product seems all that could be desired, but I should like your views, and, if I am in error, I should like to be put on the right track through the columns of your journal.

GREENFIELD, MASS., May 27th, 1889.

Note by Ed. Amer. Drugg.—We are much obliged to our correspondent for pointing out the error in the proportions given by us, on page 100 of our May number, to prepare 7 troy ounces of citrate of sodium. The error was due, so far as we can now ascertain, to a mistake in transferring figures from one paper to another.

Concerning the formula of citrate of sodium, we have to say that a neutral citrate, when crystallized, has the composition 2Na₃C₆H₅O₇·11H₂O. This salt, which readily loses its water, may easily be rendered anhydrous, Na₃C₆H₅O₇, and it is in this condition that it was supposed to be used in the formula for tinctura ferri citro-chloridi, where it will be advisable to insert, after the words "citrate of sodium," the following: "rendered anhydrous by drying."

To produce 7 troy ounces, or 3,360 grains, of this dry salt, the proportions of bicarbonate of sodium and of citric acid required are as below given, where also the proportions for 1 molecule of citrate of sodium are stated, for comparison:

	To prepare 1 mol.	To prepare 7 tr. oz.
Sodium Bicarb. (99% pure)	254.52	3,315
Citric Acid	210.	2,735
Citrate Sodium (dry)	258.	3,360

To prepare 7 tr. oz. of citrate of sodium containing 1 mol. of water (Na₃C₆H₅O₇·H₂O; mol. w. 276) there will be required: Sodium bicarbonate (99%) 3,098.5 grains, and citric acid 2,556.5 grains. The figures given by Mr. Edel (see below, page 137), correspond practically or approximately to a citrate of sodium with 2 molecules of water.

HOT-AIR APPARATUS FOR GENERAL PHARMACEUTICAL WORK.

CHARLES W. PHILLIPS, of Cincinnati, describes in the *Pharmaceutical Record* of May 20th, as follows, an apparatus for facilitating general pharmaceutical work:

A represents a heating stove, either a sheet-iron or a cannon stove being best adapted to the purpose. If this stove could be down-stairs and not on the same level as represented, the hot air being conducted up after the manner of a hot-air furnace, it would work still better.

B represents the stove-pipe connected with the chimney. This is made to fit neatly where it passes through the drum, so as not to allow the hot air to be wasted.

C represents the drum, which is raised several inches from the floor and open at the bottom, so the hot air will ascend and start a current through the entire apparatus. The top of the drum, being flat, can be used for heating beakers, evaporating dishes, etc., if desired.

D, a semi-circular pipe for conducting the hot air horizontally.

E, the fume chamber, which is connected with the chimney by the pipe F. The back of the fume chamber contains a large pane of glass and should be placed near a window; the front contains a sliding sash supported by a pulley, so that it can be raised or lowered at will. The front and back of the fume chamber being of glass, the progress of any operation can be watched without disturbing the heat or filling the air with foul odors.

G, the lower part of the fume chamber, which is inclosed like a closet, the front door of which has been removed in the cut. The object in having it closed is to protect the oil stove from currents of air and thus prevent it from smoking. In this way the doors and windows of the laboratory can all be opened, if desired—a very important item in hot weather.

H, the oil stove, which is one having three 4-inch wicks and is connected by a 7-inch pipe to the horizontal pipe. The oil stove is set on a small box, *h'*, fitted with rollers at the bottom, so that the oil stove can be easily rolled out for filling.

I and J are stills that are made to set part way down it on the horizontal pipe. The top has been removed from still J in the cut, and still I has been turned sidewise in order to show its construction. The outer part of the still I is the same construction as the still J, only smaller. The condenser cylinder slips snugly down into the outer cylinder to the bottom, as represented by Fig. 4, thus forming a water-joint. Fig. 1 represents a shallow gutter, around the inside of the still-head, which serves to collect any liquid that may condense on the top of the condenser before it reaches the beak and runs it out with the rest of the distillate, thus materially hastening the distillation. Figs. 2 and 3 represent a funnel tube reaching to within a half-inch of the bottom of the still, being soldered tight at the top. Fig. 5 represents a condenser, Fig. 6 the influx tube, and Fig. 7 the overflow. The condenser is soldered perfectly tight to the beak, and the tubes 6 and 7 are made of lead pipe. The advantages of a still of this construction are:

1. It is easily taken apart and cleaned.
2. It requires no luting.
3. It can be replenished by means of the funnel tube without taking down the apparatus.
4. In making fluid extracts, owing to its round bottom, the residue is always obtained in a compact mass.

K represents a hot funnel, which is simply a glass funnel inserted in a 6-inch hole in the flat part of the hot-air pipe D and a 1-inch hole in the lower part of the pipe. When not required for filtering, the funnel can be removed and the hole covered with a piece of sheet-iron, or it can be used for a small evaporating dish or any other purpose. L represents the drying oven, showing a sectional view, the side being removed. Being at the end of the apparatus, it is always ready for use without extra expense. The oven can be made of wood, with a pane of glass at the back and a sash door in front. The top should have eight or nine 1-inch auger-holes to allow the hot air to escape. The draft can be regulated by inserting one or more corks as required; one of the holes will serve for the introduction of a thermometer through a perforated cork.

M represents a sectional view of the horizontal pipe. It is simply a 24-inch piece of sheet-iron bent into a semi-circle with a flange, N, on each side. The diameter is then about 15 inches and the depth about 8 inches, which

is a very convenient and inexpensive size. The flange N is supported on either side by a bar of wood, R, which sustains all the weight of the stills, etc. O shows the manner in which the sheet-iron plates are secured on top of the apparatus.

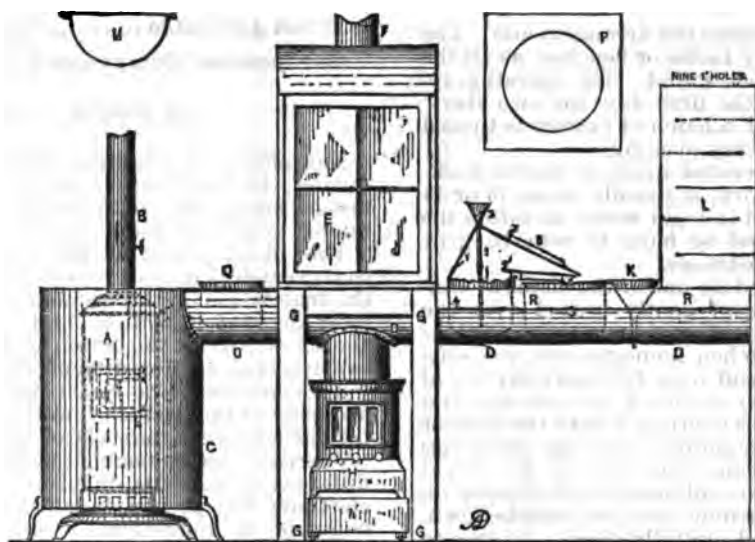
P shows a sheet-iron plate for the fume chamber. This plate is 22 inches square, with a circular hole 15 inches in diameter, and will accommodate a 3-gallon evaporator. Separate plates having circular holes 6, 7, 9, 11, and 13 inches in diameter will be found much stronger and more convenient than concentric rings, and will accommodate any evaporator from a half-pint up.

Q can be used as a sand-bath, water-bath, or water-still, but is generally too hot for fluid extracts.

This apparatus will be found available for many purposes. It has the advantage over a steam apparatus in that it does not require watching, will not freeze up in winter, and when any of the holes are not in use a flat piece of sheet-iron laid on top is a sufficient cover, no extra-tight joints being required. Another advantage is that the heat can be regulated (especially when using the oil stove) so that the apparatus will maintain a constant temperature for hours at a time, and when once the condensing water is regulated the stills can be left to themselves until the work is complete. The stills being removed and a flat piece of sheet-iron laid on the horizontal pipe, it will form a nice, warm table for spreading plasters. Either the fume chamber or the drying oven, or both, can be fitted with movable muslin trays and be used for making granular effervescent salts, or drying drugs previous to grinding or powdering. The drying oven can be fitted with movable glass shelves and used for making scale preparations. The drying oven, however, is especially valuable as a means of recovering ether. An ordinary half-gallon or gallon bottle, filled with the ether to be recovered, is placed on the lower wooden shelf of oven, the other shelves having been removed. It is then connected with a block-tin pipe by means of a closely fitting perforated cork. The pipe passes out through a hole in the side of the oven and down through an upright Liebig condenser which is supplied with a stream of cold water. Ice water is not required. When the air in the oven, as indicated by the thermometer in the top, reaches 125° to 130° F., the ether in the bottle begins to boil and distil over. Care should be taken now to have the temperature carefully regulated, and this is comparatively easy. As the door and back of the apparatus are glass and the bottle also, the operation can be easily watched and is absolutely under control. The

distillation being conducted at a low temperature, there is no difficulty in condensing the vapors and practically no loss. In the meantime all the rest of the apparatus can be used for any other purpose. When the stills are not in use making fluid extracts or recovering alcohol, they can be running distilled water. The greatest heat obtainable in the fume chamber directly over the oil stove is 420° F., and the greatest heat obtainable in the drying oven, 4 feet distant, is 220° F. With the heating stove the temperature obtainable is about the same, but cannot be quite so nicely regulated, although by the use of dampers much can be done. It is seldom necessary, however, to use the heating stove, as the oil stove in connection with this apparatus will keep a room 16x20 feet warm when the outside temperature is 32° F. While this is an advantage in winter, it is a great disadvantage in summer. I have seen the temperature of the room go up to 120° F., and that within an hour after the apparatus was started. Leaving out a few days in June, July, and August, the apparatus can be used comfortably nearly the year round.

How to Make Ground Glass.—A writer on this subject says: I desired to have several pieces of ground glass to use for some purpose. I first bought five cents' worth of emery and two plates of glass of the size required. Spoiled negatives will answer if they are cleaned, which can be done with a strong solution of lye. I placed one of the glasses on a flat board, and sprinkled a small quantity of emery on it, which I wetted with water. Placing the other glass on that, I ground them together, renewing the emery and water whenever necessary. In about one hour I had two of the finest quality of ground glasses, fully as good as those I would have to pay seventy-five cents for 8 by 10 size.



Phillips' Hot-Air Apparatus.

Extract of Opium—Chinese Method of Preparing.*

BY JOHN CALVERT, OF SAN FRANCISCO.

SOME years ago I had an excellent opportunity of observing the process of manufacturing this extract as followed by the Chinese experts who prepare the domestic article from Turkey opium in San Francisco. The details of the process are kept a profound secret by them and their employers, the wealthy Chinese merchants, but, owing to exceptional circumstances, I was enabled to study the subject and become thoroughly conversant with every point. And I may as well state, before proceeding further, that I am betraying no confidences, and I paid dearly for the information which I am about to place before you. I do not think that even now I should have been inclined to expose the details of a process which has a considerable commercial value, except for the reason that this occasion is a remarkable one in the history of American pharmacy.

I need not tell you how to prepare extract of opium. It is merely an aqueous infusion evaporated on a water-bath to a pillular consistence. An addition of 5 per cent of glycerin is ordered in the last edition of the United States Pharmacopœia.

The Chinaman proceeds otherwise. His apparatus consists of two charcoal-burning fire-clay furnaces, about 15 inches high and of about the same width, open on three sides; some palm leaf or other cheap fans, for fanning himself and the fire; several brass pans, such as are here shown; a brass ladle and several tin ones; a large spoon for skimming; a gridiron, two pairs of pincers for lifting the pans, and some thick woollen cloths to protect the hands, some fibre brushes, several buckets, basket strainers, muslin for straining, fibrous material for drawing off the liquor, some heavy sticks to be used as pestles, several spatulas about a foot long and 3 inches wide at the lower end and made of oak or ash, and a steel-bladed scraper.

One or two low stools complete the arrangements. The operator does not require any tables or benches, as all the work is done on or near the ground. The operation requires two days, but after the first day the two days' work goes on regularly, and a batch of extract is turned out by the same workman every evening.

The quantity of opium operated upon, so that a workman can do a fair day's work, is usually about 16 or 18 pounds. The balls are placed in tepid water, to soften the surface, and they are washed by hand to remove grit, leaves, and other foreign substances.

The material is then placed in one of the shallow, concave brass pans, which is kept gently heated over the naked charcoal fire, and by means of the wooden pestle is kneaded into a soft paste. When homogeneous, the softened opium is uniformly spread over the inner surface of the pan, and patted down by the hand, so as to give it a smooth surface. The heat is continued until the greater part of the moisture has evaporated, and the opium has become so solid that the pan can be turned over. The direct heat of a very small fire is now allowed to act directly on the face of the opium by turning the pan upside down. This has to be carefully and skilfully done. As soon as the surface of the material has become sufficiently hardened, it is deftly removed in thin layers, and this is continued until all the opium has been taken from the pan, except the dried portion which remains attached to the bottom and sides of the vessel. This is scraped off.

The gridiron now comes into play. The crusts which were laid aside in the former operation are now put on the gridiron, a few at a time, with the greatest care to avoid breaking them, and are toasted over the charcoal at a low temperature until they have become perfectly crisp. The crusts are then placed in one of the brass pans, covered with warm water, and left standing until the next morning.

On resuming work the infusion is drawn off into buckets through baskets lined with muslin strainers.

The brass pan is slightly tilted, and, by means of a knot of vegetable fibre, the liquor is drawn off over the edge of the pan without loss. The roasted opium is drained, and a second quantity of warm water added, with as little breakage of the crusts as possible, and the extraction is finished with a third lot of water. Only the first and second infusions are used for the extract; the washings and weak infusion are employed for the extraction of the next batch. There seems to be no precise rule as to the quantity of water for making the infusion; the crusts are merely covered.

The infusion is then mixed with some egg albumen, and a part of it is placed in the largest of the brass pans over the naked charcoal fire, and is heated, skimmed, and boiled constantly. The pan is not filled, but room is allowed for frothing, and fresh portions of warm infusion containing albumen are added from time to time as the bulk diminishes. During the boiling there are several matters to be attended to, such as keeping up the fire, or banking it up with ashes if too hot, prevention of boiling over by addition of small quantities of the infusion or of

water, and keeping the sides of the pan free from hardened extract. This is effected by water and the fibre scrubbing brushes. When all the infusion has been added, and the evaporation has proceeded as far as is considered to be necessary, the pan is removed from the fire, and the extract constantly stirred by means of a wooden spatula in a current of air produced by fanning until cool and uniformly mixed.

The yield of extract varies according to the kind and quality of opium, but I have not observed any very remarkable difference between the results of this and those of the ordinary pharmaceutical methods. Eighteen pounds of the first quality Turkey opium generally yield about ten pounds of this extract.

The greatest watchfulness is exercised over the roasting or toasting part of the process. Although a small exposed corner of the crusts may become charred occasionally, the object of this operation is to expose the opium to such a heat only as to render it porous, to do away with the quality of stickiness, which is said by some authors to be produced by an easily decomposed caoutchouc-like substance, and to allow the aqueous extractive matter to ooze out of the material without stirring.

Notwithstanding the constant repetition of cautions in all the text-books, dispensaries, and other pharmaceutical literature respecting the care to be observed about subjecting opium to heat, I do not find that there is any appreciable difference in the yield of morphine when opium has gone through this barbarous process.

Whatever changes may take place among the other proximate constituents is not known, but I am quite satisfied as to the fact that the natural morphine salts, protected by extractive, are not decomposed, or only to a very small extent, by such a heat as is necessary for the desired alteration of the valueless or inert matters contained in opium.

Is It not Advisable to Drop from the United States Pharmacopœia all Compound Galenical Preparations? *

BY JOSEPH P. REMINGTON.

THE efforts of scientific therapeutists and pharmacists during the last century have been constantly directed toward simplicity in the composition of the remedies intended to heal the sick.

The development of the study of therapy has shown that great difficulties have to be encountered in determining the true action on the economy of even the simplest and most decided remedies; and, whilst this remains true, the knowledge of the action of compound remedies must involve still greater difficulties, and to a great extent it must continue to be based upon empirical observations. To recur to the past, the most celebrated remedies of our forefathers were marvels of polypharmacy; the famous "Theriaca Andromachi," with its farrago of sixty-one different ingredients, furnishes a good illustration. This electuary was prepared under official supervision; in some countries the ingredients were openly placed upon tables in the streets for the inspection of physicians and examiners, and in Nuremberg, as late as the eighteenth century, the preparation of theriac was celebrated with great pomp as a national festival. With the decline of mystery, superstition, and witchcraft in the composition of medicines, at each revision of the pharmacopœias the compound galenical preparations which have been based upon them have been gradually improved, until the theriac of old has been shorn completely of its mystery and its majesty. The French Codex, however, still retains theriac with fifty-seven ingredients, although there has been some improvement even here, as at one time the "Electuarium opiatum polypharmicum" of the Codex contained seventy-two ingredients, including the flesh of the viper.

The British Pharmacopœia, under the name of Confectio Opii, retains all that was valuable in "poor old theriac," by making it from opium, black pepper, ginger, caraway, tragacanth, and syrup, while the United States and German Pharmacopœias omitted it entirely in the last revisions. A study of a number of other compound galenical preparations will show what the tendency of modern pharmacy has been in the past, and it is wise and timely to consider what should be the policy of the Committee of Revision of the Pharmacopœia in the future in regard to this class of preparations. A pharmacopœia must be conservative if it is expected to be useful in this country. It cannot be hoped that the practice and habits of over one hundred thousand physicians and pharmacists can be changed by one stroke of the pen of the committee, particularly when we reflect that there is no legal obligation whatever for one of them to use the Pharmacopœia; hence the wisdom of former revisers has been shown in gradually moulding and educating those for whose use the Pharmacopœia was devised, by admitting compound galenical preparations, but at each revision omitting such ingredients as were found to be superfluous, and thus therapy and phar-

* Paper read at the Annual meeting of the Am. Pharm. Assoc. at San Francisco.

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

macy have been improved and brought nearer the goals of exactness and accuracy.

Another question presents itself in this connection: Shall the Pharmacopœia admit any compound galenical preparations at its next revision? This brings into view another object of a pharmacopœia, which is to improve the practice of medicine and pharmacy already existing in the country; if the Pharmacopœia persistently ignores the existence of preparations that are in constant use, and refuses to admit them, it simply weakens its own influence and defeats its own object of being an authoritative guide in medicine and pharmacy upon the practice of its own time.

Then is it not wisest to admit such compound galenical preparations as have fully proved their usefulness by their extensive employment? If they are admitted, they should be purged of all superfluities, and the processes made so practical and free that every pharmacist in the land can make them without prejudice to his neighbor. In conclusion, the writer desires to answer the query by stating that it is his opinion that all compound galenical preparations which have not thoroughly established their usefulness throughout the country should be dropped from the next revision of the United States Pharmacopœia, and that none should be admitted to that authority except such as will stand the same test of extended usefulness; and if admitted, the processes must commend themselves to the practical worker as models of simplicity and elegance.

Laboratory Notes.*

BY PROF. E. L. PATCH.

MUCH dissatisfaction has been expressed with the U. S. P. formula for solution of magnesium citrate.

If made strictly according to the formula, after a time there is a copious precipitation of crystals.

Examination of the crystals proves them to be $Mg_3(C_6H_5O_7)_2 \cdot 10H_2O$.

This hints at an insufficiency of citric acid to produce the permanently soluble acid magnesium citrate.

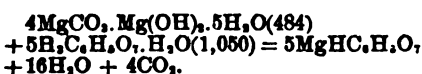
In our text-books and chemistries we have two formulas for magnesium carbonate, $3MgCO_3 \cdot Mg(OH)_2 \cdot 3H_2O$ and $4MgCO_3 \cdot Mg(OH)_2 \cdot 5H_2O$.

Several samples examined for magnesium, as MgO and $Mg_2P_2O_7$, gave as a mean 24.8% of magnesium.

Several determinations of CO_2 gave 49%.

This would give 69.44% of $MgCO_3$, 11.98% of $Mg(OH)_2$, and 18.58% H_2O , corresponding to the formula $4MgCO_3 \cdot Mg(OH)_2 \cdot 5H_2O$.

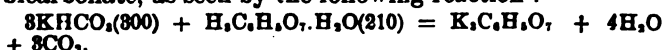
The reaction with citric acid would be as follows:



Then the U. S. P. formula must have its magnesium carbonate reduced in quantity or its citric acid increased, as seen by the following equation:

484 magnesium carbonate is to 78 Gm. magnesium carbonate as 1,050 of citric acid is to 170 Gm. of citric acid.

The syrup of citric acid cannot supply the deficiency, as 480 Gm. of syrup contain $480 \times .008$ or 3.84 Gm. of citric acid, which is not quite enough to react with the potassium bicarbonate, as seen by the following reaction:



Then 300 Gm. of bicarbonate is to 16 Gm. of bicarbonate as 210 Gm. of citric acid is to 11.2 Gm. of citric acid, and 11.2 Gm., less 3.84 Gm. in the syrup, would leave 7.36 Gm. deficiency.

This added to the 14 Gm. deficient on account of the magnesium carbonate, would leave 21.36 Gm. deficiency if the final reaction was to give acid citrate of magnesium.

This is not required to give a permanent solution, but we may allow the excess of bicarbonate to be decomposed by a portion of the acid citrate first formed.

For a permanent solution, dissolve 170 Gm. of citric acid in 800 Gm. of the hot distilled water, add the 78 Gm. of magnesium carbonate through a sieve, stir until dissolved, add cold distilled water to make 1,000 Gm., add the 480 Gm. of syrup of citric acid, filter through a plaited filter, and wash with water to make the filtrate weigh 1,500 Gm.

Place 250 Gm. of this solution in each of six magnesium citrate bottles, previously fitted with wires and corks. Gently add, so as to float on top of the previous solution, without mixing, 80 Gm. of distilled water, and, lastly, gently add 30 Gm. of a solution of bicarbonate of potassium, made by dissolving 16 Gm. of the bicarbonate in 150 Gm. of distilled water, filtering through a small filter, and

washing the filter with distilled water to make in all 180 Gm. of solution.

After adding the 30 Gm. of potassium bicarbonate solution, if need be, gently add distilled water to nearly fill the bottle, cork with smooth, firm, wetted corks, wire, shake, label, and store the bottles, lying upon their sides, in a cool place. Fifty lots so made have never crystallized, and invariably gave bright, permanent solutions.

CONTINUOUS EXTRACTION APPARATUS.

CHARLES W. PHILLIPS, of Cincinnati, suggests a form of extraction apparatus, continuous in operation, for use with a hot solvent, and of capacity for treating one pound of drug.

A represents the outer cylinder and is 8½ inches in diameter and 7 inches high, with a circular flange 1 inch wide 4½ inches from the bottom, which serves as a support when the apparatus is set into the hot-air pipe.

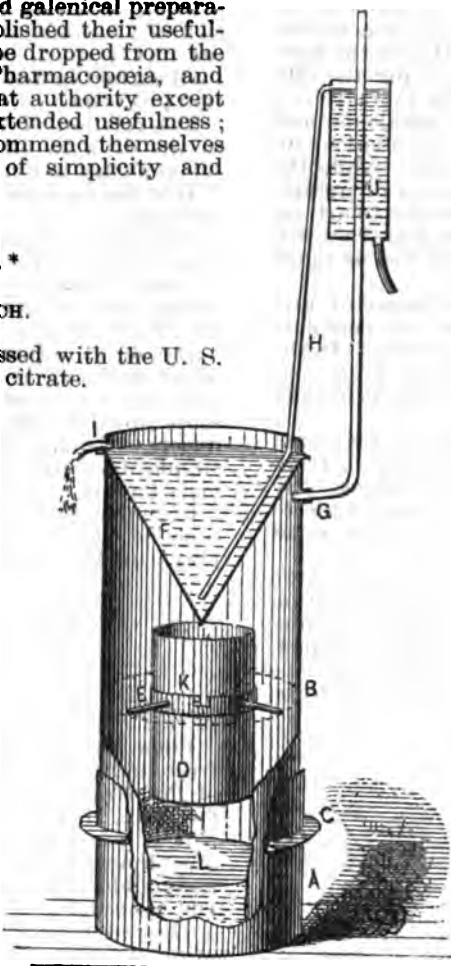
B represents the inner cylinder, which is 20 inches high and goes to bottom of cylinder A, fitting snugly.

D represents the percolator, which is simply a cylinder 4½ inches in diameter and 7 inches long, open at both ends, but wired on the inside at the bottom, in order to support the perforated plate, which can be covered with flannel or muslin and fit inside and be taken out for cleaning. Another perforated plate of the same size lies on top of the drug, but need not be covered.

E represents the wires soldered to the inner cylinder, and serve to support the percolator, which has two small projections that are locked into the ring.

F represents a funnel-shaped condenser which is 7 inches deep.

G represents an opening in the cylinder B which serves to allow the air to escape when setting up the apparatus, and also for the introduction of a pipe by means of a perforated cork, and connected with the condenser J, which serves to condense any vapors that have escaped the condenser F, and return the liquid to the apparatus. The condensing water from J can be run by the pipe H into the condenser F, thence through the pipe I to the drain. The vapor from the liquid L will rise, condense on the condenser F, adhere to the sides of the condenser, run down and drop into the percolator D, which being entirely surrounded by the hot vapor, the extraction is accomplished almost at a boiling heat.—*Pharm. Record*.



Phillips' Extraction Apparatus.

A Substitute for Musk.

MESSRS. SCHAUFFER & HUFFELD have patented a process for the manufacture, by chemical means, of a substitute for musk. They take 3 kilos. of metaxyol with 2 kilos. of isobutyl alcohol, add 9 kilos. of chloride of zinc, and heat the whole at a temperature of 220° to 240°, until the pressure, which at first rises at the rate of 25 or even 29 atmospheres, has descended to below 6 atmospheres. The process takes from six to eight days. The resulting hydrocarbon, corresponding to the formula $C_{11}H_{14}$, is collected, and the part of it which boils between 190° and 230° is rectified. The product of this reaction yields with water a red-brown oil, which is washed with water, rendered slightly alkaline, and is then ready for use.—*Chem. and Drugg.*

Regarding this article, Messrs. Schimmel & Co. say in their last report (April, 1889) that they have carefully examined the product, and find it absolutely useless and valueless for perfumers. It is a liquid having an odor of succinic and nitric acids, and leaves a musk-like odor only after having been largely diluted and volatilized. But the perfumer requires the musk odor, as such, ready-made, and not latent, in which shape its adjustment would be beyond his control.

Chromic Acid as a Remedy for Sweating Feet.—The problem which seems to be causing German military men the greatest trouble is the relief of excessive perspiration of the feet. The medical department of the army has just recommended painting the skin of soldiers' feet with a 5 or 10% solution of chromic acid once in 2 or 3 weeks; indeed, in some cases, an interval of 6 or 8 weeks suffices. It is said that the remedy was tried on 18,000 soldiers before its use was thus recommended.

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

Nux Vomica.*

BY W. SIMONSON, OF CINCINNATI, O.

WHEN at the next revision of the Pharmacopœia the total alkaloids become the basis of adjustment of strength of tincture of nux vomica, change from the present standard of 2 per cent dry extract will require that the average alkaloid value of that extract be accurately determined.

From an abundant number of assays of the pillular extract, as reported by a number of analysts, the average is usually taken to be 15 per cent, and in some assays of commercial powdered extract, as detailed in the Proceedings for 1888, the average of such specimens as appeared to have been well made was near, but above, that figure. An unusual experience in preparing the tincture as directed by the Pharmacopœia, the value in alkaloids being also found, and in making a number of lots of the powdered extract, using in all cases the commercial powder, but carrying the extraction as near to exhaustion as practicable, has shown that the value in total alkaloids of the dry extract was between 16.5 per cent and 17.25 per cent.

The object of this note is to direct attention to the fact, doubtless long well known to many, that, using the official menstruum—alcohol of 80 per cent—the extractive in the first part of the percolate is poorest in alkaloids, and that the percentage value of the extract in alkaloid increases as the exhaustion proceeds. Hence, while the quality of the drug must vary, from causes of nature, part of the observed variations are probably due to art, inasmuch as, using the same materials, the total extract will be weaker or stronger as the exhaustion is less or more complete.

In support of this statement two percolations of nux vomica were made, and the fractions of each percolate examined as detailed in the two following tables. In the first the drug was used in coarse powder, known as "rasped," and in the second in the fine powder as usually seen in commerce.

1. Fifty pounds of rasped nux vomica were percolated with alcohol (80 per cent) to obtain 150 pounds, in three equal fractions. The percolation was rapid, and necessarily extraction was far from complete, it being preferable to waste drug rather than alcohol—conditions that must apply on a large scale.

2. Two kilogrammes of finely powdered nux vomica were treated according to official instruction, the percolation being at the rate of about 500 grains daily, and stopping when 10 kilogrammes of percolate had been obtained, taken in ten fractions. In time and under other conditions of percolation these two extractions are believed to be extremes as conducted in ordinary practice.

I. DRUG AND MARC.

		Alkaloids.	Strychnine in Alkaloid.	Degree of Extraction.
Drug	Assay 1....	2.518 per cent.	55.7 per cent.	
	" 2.....	2.54 "	55.2 "	
Marc	Top of column...	1.19 "	54.8 "	53.2 per cent.
	Bottom of column	1.659 "	54.8 "	34.7 "
Total extraction as shown by residue in Marc....				44.0 "

PERCOLATE.

Fraction.	Extract.	Alkaloid in Extract.	Fat in Extract.	Strychnine in Alkaloid.
1	5.788 per cent.	15.00 per cent.	48.7 per cent.	53.5 per cent.
2	2.09 "	18.60 "	25.0 "	53.8 "
3	1.52 "	19.25 "	18.1 "	55.0 "

II. DRUG AND MARC.

		Alkaloids.	Degree of Extraction.	Total.
Drug	Assay 1.....	2.886 per cent.		
	" 2.....	2.886 "		
	" 3.....	2.892 "		
Marc	Top of column...	.42 "	85.5 per cent.	
	Middle of column	.78 "	74.67 "	
	Bottom of column	.843 "	70.90 "	77.0 per cent.

Strychnine in alkaloids from drug and marc 51.5 to 53.0 per cent.

* Read at the meeting of the Ohio Pharmaceutical Association, in answer to Query 48: Is the relation of alkaloids to extractive constant in exhausting nux vomica—that is, will the tincture be exactly the same (when adjusted to 2 per cent of extract) whether extraction be complete or incomplete?

PERCOLATE.

Fraction.	Extract.	Alkaloid in Extract.	Fat in Extract.	Strychnine in Alkaloids.
1	7.60 per cent.	15.0 per cent.	— per cent.	53.1 per cent.
2	7.47 "	14.9 "	28.0 "	— "
3	4.85 "	17.3 "	15.3 "	— "
4	3.23 "	20.67 "	— "	— "
5	1.95 "	21.87 "	15.5 "	— "
6	1.10 "	24.60 "	15.5 "	— "
7	.896 "	23.26 "	— "	— "
8	.742 "	23.22 "	— "	— "
9	.580 "	20.40 "	— "	— "
10	.506 "	18.15 "	15.6 "	53.35 "

I. Total extract contained 16.45 per cent alkaloids.

II. " " " 17.00 " " "

From these returns it may be assumed :—That the relation of alkaloids to extractive is not constant in exhausting nux vomica, and that, up to a reasonable limit, the total extract increases in strength slightly as the percolation proceeds.

The relation of the alkaloids to each other is the same in the drug in all fractions of the percolate and in the unexhausted marc.

That the oil is removed most readily by first fraction of percolate.

That the value of a well-prepared extract is 16.5 per cent or more of total alkaloids.

Upon a basis of 2 per cent dry extract the tincture should contain not less than 0.320 per cent alkaloids, a better average being near 0.335 per cent.

The object of this note is to show that the standard to be adopted should be within or near these limits, and the necessity for adopting some more definite basis is made more apparent by the tendency, among the larger producers at least, to degrade the tincture by erecting low standards of strength, as little as 0.265 per cent total alkaloids having been assumed as a safe basis.

In conclusion, the writer wishes to acknowledge obligations to Prof. Lloyd for a part of the material used in preparing this work.

Commercial Chloride of Lime.*

(Chlorimetric Assay.)

BY EUGENE A. AND J. G. SPENZER.

FOUR samples of package chloride of lime and one of fresh bulk were examined, after Fresenius' modification of Penot's method (Fresenius, "Quant. Chem. Analyse," 6te Aufl., II., 320).

It is based upon the conversion of arsenious acid into arsenic acid, being effected in an alkaline solution; starch-and-iodide-of-potassium paper is employed to ascertain the end reaction.

The arsenious acid solution, from the danger of deteriorating unless perfectly pure, was freshly prepared; each C.c. of this solution contains 0.004436 Gm. of arsenious acid, corresponding to 1 C.c. of chlorine at 0°C. and 760 Mm. barometer pressure.

The chloride of lime solution is made 10 Gm. to the liter, each C.c. representing 0.01 Gm. of chloride of lime; 50 C.c. of this solution were used at each trial.

The number of C.c. of arsenious acid solution used, multiplied by 2, gives the chlorimetric degrees, which multiplied by 3.17763 gives the percentage of chlorine in the chloride of lime, viz.:

	Degree.	Multiple.	Percentage.
1 C.c. of arsenic solution required	42.6=85.2°	×3.17763	27.07%
2 " " " " "	42.4=84.8°	×3.17763	26.94
3 " " " " "	42.2=84.4°	×3.17763	26.81
4 " " " " "	41.6=83.2°	×3.17763	26.43
Bulk " " " " "	38. =66°	×3.17763	20.97

Only in the sample of the bulk did it fall below the pharmacopœial per cent (at least 25 per cent).

Glycerin—Vegetable and Animal.†

BY J. GEO. SPENZER, OF COLUMBUS, O.

THAT in comparative examinations it is necessary to procure and operate on the examined substance under like conditions as regards quality, grade, etc., determined by price and history, is self-evident, else the results would possess no special significance, nor would they tend to a comparison.

Below are given reasons why in the present case this could not be done in as desirable a manner as was wished.

While it is not probable that a manufacturer would mix

* Read at the meeting of the Ohio Pharmaceutical Association.
† Read at the meeting of the Ohio Pharmaceutical Association, in answer to Query No. 30: Commercial glycerin is now obtained from two sources, vegetable and animal fats; is that from the former source superior to that from the latter?

glycerin made from vegetable fat with one prepared from animal, and while in crude glycerin impurities do exist which allow of the discovery of its source or the process by which it was made, these clues are almost, if not entirely, removed in distillation and redistillation.

In the manufacture of stearin candles a mixture of palm oil and tallow is used, resulting in a mixed or animal and vegetable glycerin. In the manufacture of soap this is also often the case, while since much of the crude glycerin distilled in this country is imported, it is undoubtedly of the same mixed origin. The examination includes three samples of vegetable and two of animal (tallow) glycerins.

GLYCERIN.	VEGETABLE.			ANIMAL.	
	1	2	3	4	5
Specific gravity, 17.5° C..	1.2557	1.2556	1.2583	1.2525	1.2568
Absolute glycerole, 15° C..	97%	97%	98%	96%	98%
Formic acid.....	None	None	None	None	Very faint trace.
Butyric acid.....	"	"	"	"	"
Acrylic acid.....	Trace	Trace	"	"	Trace
Higher fatty acids.....	None	None	"	"	"

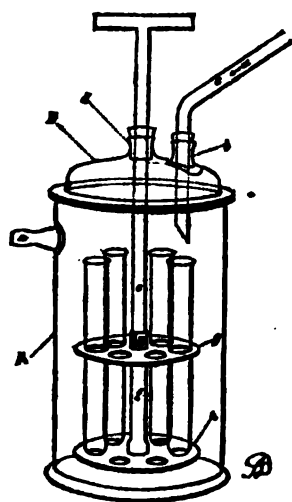


FIG. 1.

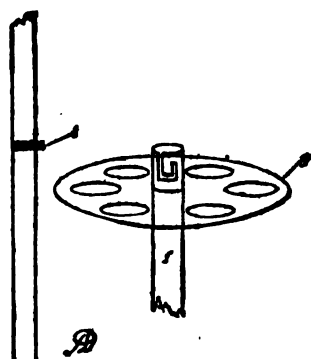


FIG. 2.

Apparatus for Fractional Distillation.

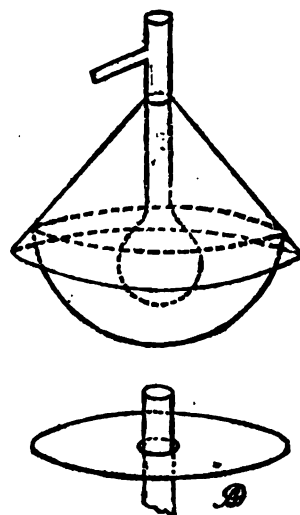


FIG. 3.

In freedom from color, odor, metals, and adulterations, they conformed to the Pharmacopœia; all were neutral to litmus.

The results, as they are, are not entirely satisfactory, because of the limited number of samples, occasioned by the difficulty of finding a strictly animal glycerin; as it stands, the results are creditable to the animal glycerin, since it costs one-fifth the price, is sold in cans, and is therefore not of the same grade; a sample of the same grade was unobtainable.

It is difficult to see why a glycerin made from nice, clean tallow is not as good as that from vegetable oils.

Wm. H. Clark (*Am. Jour. Pharm.*, 1887, p. 608) considers them to be equal in quality.

Test for Antipyrine.—The now well-known reaction between nitrous acid and antipyrine can be utilized as a test for antipyrine in the following manner: Place in a test tube a few grains of potassium nitrate, add a little water and then an excess of strong sulphuric acid, and fill the tube with the suspected liquid. A green coloration is immediately produced if antipyrine be present.—A. C. STARK, in *Pharm. Jour.*

APPARATUS FOR FRACTIONAL DISTILLATION IN A PARTIAL VACUUM.

FOR fractional distillation in a partial vacuum, J. W. Bruehl recommends the following apparatus, a diagram and description of which are given above:

A is a glass cylinder connected at *a* with the vacuum apparatus and provided with a ground edge, on which rests the glass cover B. The tube *c*, which is connected with the distilling apparatus, passes through an india-rubber cork fitting tightly into the tubulure *b*. A glass rod, *e*, provided with a handle, passes through an india-rubber cork tightly fitted into the tubulure *d* almost to the bottom of A, and at a short distance from the lower extremity is pierced with a hole in which is pressed a pin, *i* (Fig. 2). *f, g, h*, consists of a hollow stem, *f*, to which the discs *g* and *h* are attached; it is made of ebony and can be fastened on to *e* by means of a bayonet-shaped catch.

Test tubes having been placed in the holder *f, g*, and *h*,

the rod *e*, to which the cover B is attached, is fitted into the stem *f*; the two portions, made fast by means of the catch, are placed in A, and the apparatus made air-tight by pressing the greased edges of A and B together. The distilling vessel is then made air-tight, *a* is connected with the vacuum apparatus, and the distillation proceeded with; by turning the rod *e* the receiver can be changed at will. It is unadvisable to move the india-rubber stoppers after they have once been placed in position, but when the central one requires replacing, the pin in the glass rod can be easily removed.

The air-bath (Fig. 3) can be advantageously employed for all distillations.

The flask is suspended in a hemispherical metal basin so that it does not touch the bottom or sides, and is covered by an asbestos cone, which is provided with a radial slit and a circular opening to admit the neck of the flask. The temperature can be regulated and kept constant quite as easily as when a water-, oil-, or any other liquid-bath is employed. For high temperatures the metal refractor shown in Fig. 3 is fixed on the Bunsen lamp.—*Berichte and J. Soc. Chem. Ind.*

Cantharidin in Pharmacy.*

BY PROF. F. A. GRAZER.

THE use of cantharidin in pharmacy has been very limited, as far as I have been able to determine, although

quite a number of methods have been recommended for separating this principle from the flies. Most of these have been used, no doubt, with a view of determining the quality of the flies, their value being estimated by the amount of cantharidin, and as a matter of experiment.

My attention was attracted to the use of cantharidin while making some cantharidal collodion. I noticed how easily this principle could be separated by the method adopted in that process. In the preparation a considerable amount of cantharidin remained undissolved by the collodion, even after agitation for several days.

It occurred to me that it would require but a little extra labor to remove the fatty matter with carbon bisulphide, and obtain the cantharidin in a tolerably pure state, by which the quality of the drug used might be estimated, and at the same time a collodion, prepared of a known strength, by simply adding the cantharidin to the requisite amount of flexible collodion. A preparation made in this manner yielded satisfactory results.

A short time after this I was called upon to make some vinegar of cantharides according to the British Pharmacopœia. I found the process a tedious one, especially that part of the process requiring percolation, which was exceedingly slow and unsatisfactory. A preparation equally efficacious was readily made by simply dissolving cantharidin in a mixture of glacial acetic and ordinary acetic acids, corresponding to the menstruum used in the preparation.

While I have not made any further experiments, I might suggest its use in the liniment of cantharides, and the cerate of the extract of cantharides. Referring to the last-named preparation, I have often wondered why the Pharmacopœia is burdened with two cantharidal cerates. The plain cerate of cantharides, if properly made with a good specimen of powdered flies, seldom fails to give satisfaction. The claim for the cerate of the extract is, that it is an elegant and efficient substitute for the ordinary cerate, as the greater portion of the inert matter is removed in the process adopted for its preparation.

The object of this preparation, therefore, is simply to

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

remove the vesicating principle in as pure a state as possible, and to combine it with a suitable base. The process is somewhat cumbersome to the druggist, as it involves percolation, distillation, and evaporation, the final result being the removal of the cantharidin, associated with a considerable amount of extractive. A more simple method would be to add a chloroformic solution of cantharidin to a melted mixture of wax, lard, and resin, or the cantharidin may be dissolved by means of heat, in a mixture of rape-seed and castor oil, and then added. In doing this it would be necessary to diminish the amount of lard, as the oil would render the cerate too soft.

But is this elegant and efficient substitute an improvement over the ordinary cerate? So far as I can learn such is not the case. If the objection to this preparation be the mechanical admixture of the powdered flies, I hardly think it justifiable, as these small particles of the hard exterior parts of the insect have a tendency to irritate the skin, and thereby facilitate the vesicating action.

I had occasion, some time ago, to test the relative merits of these two preparations. The cerate of the extract failed to give the satisfaction which the cerate had previously given. That the former preparation contained sufficient cantharidin there could be no doubt, as, six months after its preparation, I found the entire surface thickly studded with cantharidin crystals.

Cantharidin dissolved in oil has been used in Germany. In the last issue of the *Pharmaceutische Rundschau*, New York, May, 1889, a process is given for making cantharidal oil, as formerly recommended by E. Dieterich, Helfenberg, Germany. It was made by dissolving three parts of cantharidin in two thousand parts of rape-seed oil. It has been shown by F. Eger that a portion of the cantharidin in the preparation is precipitated after a time, and he recommends the use of castor oil. The following formula is suggested for a permanent preparation: 0.3 Gm. of cantharidin is dissolved in 20.0 Gm. of castor oil and 40.0 Gm. of rape-seed oil by means of heat, after which 140.0 Gm. of rape-seed oil are added.

The main objection to the use of cantharidin is its expense. In Merck's Index 1 Gm. is quoted at \$2. It can, however, be made more cheaply by the druggist himself.

The separation of cantharidin is not difficult; it is easily accomplished by percolating the powdered flies with chloroform. I have used for this purpose a narrow Whitall-Tatum percolator, in the bottom of which a cork was inserted, containing a glass tube drawn out to a fine point and curved upward. In this manner I was able to prevent the percolation from going on too rapidly. The chloroform was recovered for future use by means of an old style alembic, connecting with an empty bottle, acting as a receiver and kept cool.

With a water-bath placed over an ordinary spirit lamp the distillation can be carried on until the greater portion of the chloroform is recovered. The fat can be removed after evaporating the remaining chloroform by means of carbon bisulphide or petroleum ether. In this manner it may be obtained sufficiently pure for pharmaceutical purposes. The powdered drug as found in this market is generally good, containing about 8% of moisture and a fair yield of cantharidin.

Other processes have been recommended, such as treating the flies with alkalies and subsequently with acid before using chloroform or ether, by which means a larger yield is obtained. Perhaps the best method is that of dialysis recommended by E. Dieterich. But as far as the commercial article is concerned, it is yet too expensive to be used, at least in this country.

I would, therefore, recommend the druggist to prepare it himself, as I believe that cantharidin could be used in a number of the pharmaceutical preparations now kept in the stores, thereby saving considerable time, besides securing preparations of known strength, which is always an object to be desired.

SAN FRANCISCO, May 1st, 1889.

Manufacture of Oleomargarin.

THE following description is taken from the Report of the U. S. Commissioner of Internal Revenue. The ingredients used are: Oleo oil, neutral lard, some liquid vegetable oil—as cotton-seed, sesame, or peanut—butter in the higher grades, cream and milk, together with salt, and annatto or other coloring matter.

The manufacturer of oleomargarin usually buys the refined materials in the open market. The manufacture of oleo oil is generally carried on in connection with the large slaughter and packing houses situated in or near the principal cities. The caul and suet fats are removed from the freshly slaughtered beeves and placed in tanks filled with water at 75° to 85° F., where they remain from two to three hours before being transferred to other tanks containing iced water. By this procedure the fats are gradually deprived of their animal heat, and the danger of their becoming rancid is avoided, as would happen if the mass of fat were suddenly chilled by being placed directly in iced water. The caul, long or slaughter fat, is kept separate from the suet fat, which yields an inferior grade of oil,

A Texan steer will yield on an average 65 lbs. of caul and suet fats, from which are obtained 28 lbs. (43 per cent) of oleo oil, 21 lbs. (32 per cent) of oleostearin, and 12 lbs. (20 per cent) of high-grade tallow. The chilled fat, after thorough washing from blood, is fed into hashers working at high speed, from which it issues through fine sieves into the rendering tank. No fat remains on hand longer than fourteen hours, usually not more than four hours, before being rendered. The rendering tank is a steam-jacketed upright kettle of 2,000 to 5,000 lbs. capacity, provided with revolving blades. Steam being let into the jacket, the hashed fat is continuously fed in, and kept in motion by the stirrer. When the tank is full and the contents thoroughly melted, the temperature being 120° to 150° F., the fat is allowed to rest for the water and scrap to settle. The clear fat is drawn off from the top and run into the graining on seeding cars of 400 to 600 lbs. capacity. The temperature of the room in which these cars are stored is maintained at 85° to 95° F., and the whole contents of the car will be in a semi-solid condition in from one to three days. This fat is free from all "greasy" taste. It is now taken to the press room, kept at 70° to 80° F., where it is ladled out on a stout linen cloth, which is folded up ready for placing in the screw-press. When the press is filled, pressure is gradually applied, and the expressed oil constitutes the "oleo oil." This liquid fat is allowed to cool in barrels, and at ordinary temperatures forms a soft, granular, tasteless, and nearly colorless fat. The hard fat remaining in the filter bags forms the beef or oleostearin, which is used for making "refined lard" by the addition of cotton-seed oil, or is sold to the soap and candle maker.

The manufacture of "neutral lard" is conducted by essentially the same machinery and at about the same temperature as for oleo oil, but only the leaf fat of freshly slaughtered hogs is used. A hog yields from 5 to 15 lbs. of leaf lard, of which 100 lbs. yield 50 lbs. of "neutral." The screw-press is not employed to separate the stearin, but the melted fat is run directly from the rendering tank into a very strong, iced brine, where it remains for twenty-four hours before being placed on shelves to dry. The "neutral" is a white, slightly granular, tasteless, solid fat.

The by-products of the oleo oil and neutral lard manufacture—namely, stearin, tallow, and lard—are standard merchantable articles. Only fresh and sweet fats are used, and great cleanliness is observed through all the processes. The vegetable oils employed are refined by ordinary methods, whereby a product of a light straw color and bland taste is obtained. The butter used is always selected for its high flavor. The granular character of oleo oil requires the addition of a softer fat, such as neutral lard or cotton-seed or other vegetable oil, in order to approach more closely to the consistency of butter. The proportions in which these ingredients are used vary with the season of the year, the grade desired, and the formula of the manufacturers. The charge of milk or cream, however, is the same for all grades manufactured by any particular factory, and varies from 10 to 20 per cent. The milk or cream is allowed to become slightly sour.

The mixing of the materials to form the butter substitute is conducted in a steam-jacketed churn of from 1,200 to 2,500 lbs. capacity. The oleo oil and neutral lard are melted in separate vessels at 90° F. The charge of milk or cream is first run into the churn, and the paddles are kept in motion until the butter begins to form. Then the oleo oil is added and stirred, next the neutral lard, and finally the annatto to give the desired color. The butter is either added to the churn or worked in subsequently. The temperature is carefully regulated, beginning at about 85° F. and increasing gradually to 105° F. at the end of the operation, when the whole charge has the appearance of a yellowish, creamy fluid. From twenty to ninety minutes are occupied in the churning. The finished charge is run into tanks containing chopped ice and constantly stirred, or is met by a stream of iced water as it issues from the churn, the object being to give the mass a fine grain by the sudden cooling. The chilled mass is then placed on wooden trays to drain. Here the salt is added and allowed to work itself in, which generally takes from twelve to twenty-four hours. The salted mass is then thoroughly worked by mechanical rollers to remove the buttermilk and water.

Oleomargarin is placed on the market either "solid packed" or in prints or rolls. Four grades are generally made, known as "dairy" and "extra dairy oleomargarin," "creamery" and "extra creamery butterin," the last two containing from 10 to 25 per cent of the best creamery butter; in the lower grades, from 25 to 60 per cent of neutral lard, 20 to 50 per cent of oleo oil, 5 to 25 per cent of vegetable oils, and in some cases from 2 to 10 per cent of butter, with 10 to 20 per cent of milk or cream, are the proportions used. Some factories employ no vegetable oils in their oleomargarin, preferring to use a larger proportion of neutral lard with a small amount of butter to obtain the desired butter consistency. In the higher grades the proportions of oleo oil are reduced, the vegetable oils are discarded, and creamery butter is used to make up the charge,

Tests for Impurities in Alcohol, and Quantitative Estimation of the Latter.*

I. Tests for Water.

1. On adding a small amount of finely powdered, fused carbonate of potassium to aqueous alcohol, and shaking, it becomes damp if the alcohol contains not less than about 98 per cent of absolute alcohol. In presence of more water it melts.

2. Alcohol over 98 per cent is miscible in all proportions with carbon disulphide. At 98 per cent, it is only miscible with an equal volume of this liquid, and, if of lower percentage, with a proportionately less quantity (Barfoed).

3. Faintly ignited sulphate of copper, when added to anhydrous alcohol, remains perfectly white. In presence of water, and shaking, it gradually acquires a blue color, which appears the more quickly the more dilute the alcohol is.

4. On adding a drop of alcohol containing 3 per cent of water to 3 or 4 C.c. of benzol, the liquid remains clear. If between 3 and 7 per cent of water is present, a cloudiness appears; if over 7 per cent, droplets separate. On dissolving 1 C.c. of benzol in 2 C.c. of absolute alcohol, it requires the addition of 10 C.c. of an alcohol containing 70.9 per cent by volume before a permanent cloudiness appears (Hager).

5. If paraffin oil is dissolved in absolute alcohol or in anhydrous chloroform, and this solution mixed with a few drops of an aqueous alcohol, the liquid at once becomes turbid; $\frac{1}{10}$ vol. of water may thus be still detected (L. Crismer).

6. Heat a mixture of 2 parts of citric and 1 part of molybdic acid to incipient fusion, dissolve the dark blue mass in water, and saturate with this solution some strips of white filtering paper. On drying the latter at 100° C. they show a blue color, which is immediately destroyed if the strips are dipped into an aqueous liquid. Absolute alcohol does not alter the color, but the more water it contains the more rapid will be the discharge of color (C. Mann).

7. On adding a little sodium amalgam to 0.001 Gm. ($\frac{1}{10}$ grain) of anthraquinone, and then some absolute alcohol, a liquid having a fine green color is produced. On shaking this with air, the green color disappears. But if the alcohol is aqueous, there appears, particularly on gently moving the liquid about, a handsome red color around the sodium amalgam. On shaking with air, the tint disappears, but returns upon standing.

II. Tests for Methyl Alcohol.

(The method of Riche and Bary is omitted here, as it is too circumstantial.)

8. Method of P. Cazeneuve and S. Cotton. This is based upon the action of permanganate of potassium. Ten C.c. of the alcohol are mixed, at 20° C., with 1 C.c. of solution of permanganate of potassium (1:1,000). Pure ethylic alcohol reduces the latter in about 20 minutes, turning the liquid yellow. In presence of wood spirit, the reduction takes place at once. If the alcoholic liquid to be examined contains sugar, it must be distilled off and the distillate examined as directed before. If ethereal oils are present, as in a brandy, about 40 C.c. of the latter are shaken with two successive portions of 20 C.c. of purest olive oil. The latter being separated, the alcohol is filtered through a double wetted filter. If no sugar is present, the permanganate test may be at once used. In presence of sugar, it is necessary to distil (Habermann).

III. Tests for Amylic Alcohol (Fusel Oil).

9. Evaporate the alcohol at 60° C. and examine the residue as to its odor (Nessler and Barth).

10. Into a glass tube, 7 to 8 inches long, $\frac{1}{4}$ inch wide, and open at both ends, push a roll made of filtering paper about 6 inches long. If the suspected alcohol contains more than 60 per cent of absolute, dilute it with an equal volume of water, mix it with a little glycerin, and saturate the paper-roll with this liquid. Allow the tube to stand 15 minutes first in an upright, then in a horizontal position, at a temperature of 25° C. When the alcohol has evaporated (after 24 to 48 hours), any amylic alcohol present (even in traces) would be revealed by the odor (Hager).

11. Dilute 5 C.c. of the alcohol to be examined with 6 to 7 times its quantity of water, add 15 to 20 drops of chloroform, and shake. The chloroform dissolves the amylic alcohol. On separating the chloroform and cautiously evaporating it in a capsule, the amylic alcohol will remain behind, and may be recognized by its odor or reactions (C. Betelli).

To determine fusel oil quantitatively, 100 C.c. of the alcohol are put into a flask of the capacity of about 200 C.c., and the contents distilled on a water-bath. The neck of the flask, together with the distilling tube (of about $\frac{1}{4}$ inch diameter), should project 8 inches from the mouth of the

water-bath. During the distillation the fusel oil remains wholly within the flask, and may be weighed therein. If larger quantities of alcohol have to be distilled, owing to the small proportion of fusel oil, the distilling flask is provided with a little funnel for periodically refilling it. Should the alcohol contain less than 70 per cent of absolute, a portion of the water will remain behind with the fusel oil. In this case a little pure absolute alcohol is added to the residue, and the distillation repeated (Hager).

According to Uffelmann, the fusel oil may be approximately determined quantitatively as follows: Mix 250 C.c. of the alcoholic liquid (for instance, brandy) with 100 C.c. of ether, shake, add water, remove the ethereal layer, and again shake with 100 C.c. of ether. Evaporate the ethereal extracts to about 40 C.c., add a few C.c. of freshly prepared green solution of methyl violet (made by dissolving 1 part of methyl violet in 100 parts of water, and adding enough of 2 per cent hydrochloric acid to just turn the liquid green), and set it aside in a graduated tube of 1 inch diameter. As soon as the ether shows a bluish tint, and the spectroscope still reveals the absorption band, at D, of methyl violet, the quantity of ether is read off. Every 10 C.c. of this contain then 0.2 C.c. of amylic alcohol.

IV. Test for Aldehyde.

Mix 1,000 C.c. of solution of fuchsine (1 in 1,000) with 20 C.c. of solution of bisulphite of sodium, spec. grav. 1.260, and add 10 C.c. of concentrated hydrochloric acid. One C.c. of this reagent is mixed with 2 C.c. of the alcohol, brought to a percentage of 50. If aldehyde is present, a more or less deep red color will be produced. By making parallel experiments with alcohol containing known proportions of aldehyde, the amount present may be approximately determined.

V. Test for Furfural.

Mix 10 C.c. of the alcohol to be examined with 10 drops of colorless aniline and 2 to 3 drops of hydrochloric acid. If furfural is present, a red color is produced. If only traces are present, the alcohol is mixed with an equal volume of water, shaken with chloroform, and the residue treated with aniline and hydrochloric acid as above (K. Jorissen).

A mixture of equal volumes of xylydine and glacial acetic acid, to which a little (pure) alcohol is added, acquires an intense red color with the least traces of furfural. Or a strip of white filtering paper may be impregnated with the mixture, and then exposed to the vapors of the liquid in which furfural is to be looked for (H. Schiff).

IV. Determination of Organic Bases in Commercial Alcohol.

Crude commercial alcohol, chiefly that made from potatoes, often contains small quantities of volatile organic bases containing nitrogen. These may be converted into ammonia by Kjeldahl's method. One-half to 1 quart of the alcohol are diluted to 50 per cent, mixed with 20 Gm. of sulphuric acid, shaken for some time, and then the alcohol and water distilled off; 0.5 Gm. of metallic mercury is now added, the whole heated nearly to boiling for 1 or 2 hours, and then diluted with water. Sulphide of potassium and solution of potassa are now added, the ammonia driven out by boiling and caught in a known quantity of volumetric sulphuric acid.

VI. Quantitative Determination of Ethylic Alcohol.

The quantitative estimation of ethylic alcohol is accomplished by determining either the specific gravity of the alcoholic liquid, or the number of drops in a definite volume, or the quantity of permanganate required to completely oxidize it.

These three methods presuppose that the liquid contains nothing else but alcohol and water.

The first method is so well known that it need not be explained here.

The second method, devised by Traube, is one which is not generally accepted as reliable, and may therefore be passed over.

The third method, by permanganate, devised by Br. Röse, is performed as follows:

Dilute the alcoholic liquid to about 1 per cent of absolute, transfer 5 Gm. to a small flask, add 50 C.c. of solution of permanganate of potassium containing 10 Gm. of the salt in 1 liter, and add, by means of a pipette, 20 C.c. of concentrated sulphuric acid under constant agitation. After one minute dilute with about 100 C.c. of water, and decompose the remainder of the permanganate by more than a sufficient quantity of the volumetric solution. Heat to boiling and complete the titration by standard permanganate.

To completely oxidize 1 Gm. of absolute alcohol there are required 8.244 Gm. of permanganate of potassium.

The author recommends to prepare the oxalic solution, not with oxalic acid, but with quadroxalate of potassium ($\text{KHC}_2\text{O}_4 \cdot \text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$).

The author adds seven other methods for determining alcohol quantitatively, but does not go into details. Most of these methods require special apparatus, and the results are, moreover, not always fully reliable.

* From Part I. of "Anleitung zur chemischen Analyse organischer Stoffe." Von Dr. G. Vortmann, Privatdocent an der technischen Hochschule in Aachen. Svo. Leipzig und Wien, 1889. (Guide to the Chemical Analysis of Organic Substances, etc.) A very useful work, which we can recommend to all interested in organic chemicals.

Starch Wax—A New Pill-Excipient.

H. HAGER recommends in the *Pharmaceutische Zeitung* what he terms *Cera Amylata* as an excipient for pills. The mode of its preparation is as follows, it being essential that the substances employed are completely free from water: From pure light-colored beeswax fine lamellæ as thin as thin note-paper are cut with a sharp, thin knife; they are placed in a porcelain dish; the latter is covered with paper to keep away all dust, put into a dark place for five to ten days at the ordinary temperature of the room, to cause evaporation of all inherent moisture. Wax which is several years old requires only two to three days' drying, while fresh wax requires at least ten days. A certain quantity of wax dried in this manner is weighed, also an equal amount of starch; the latter and half of the wax are placed in a porcelain mortar, the inside of which is made rough. Both substances are then carefully and slowly triturated to a powder; afterwards the other half of the wax is added, and trituration is continued until a fine powder is obtained. The latter is passed through a fine sieve and filled into the bottles.

The temperature during trituration should not be above 16° C.; a temperature of 10° to 12° C. is the most suitable. To prevent heating by friction, and formation of small lumps, trituration should never be effected rapidly. Particles sticking to the sides of the mortar or to the pestle are removed with an iron spatula or rounded knife, and again triturated by employing gentle pressure. Starch wax is a white powder of medium fineness, consisting of a mixture of equal parts of yellow beeswax and best pure rice starch. The mixture forms an excellent base for pills and medicated bougies, as its therapeutic action is quite indifferent. Pills made with this preparation are readily digested and completely decomposed in the intestinal tract. Some physicians still seem to entertain the opinion that pills made with wax are not digested; but if wax is mixed with certain substances to such a percentage that the melting point of the mixture is at 50° C., the pills made with this mass do not remain intact but decompose, and are absorbed all the better when a vegetable powder such as starch is added. Five to fifteen pills made of 2 dr. wax, 1 dr. castor oil, $\frac{1}{2}$ dr. balsam toluatan, and 1 dr. radix gentian, each pill weighing 3 grains, were given per day, and yet not a single pill was found on searching the fæces.

Starch wax is indicated in all cases where essential, fatty, or empyreumatic oils or other substances not readily miscible with water, such as extr. filicis, menthol, guaiacol, creosote, have to be transformed into solid substances and shaped into pills. The addition of water or alcohol has, in such cases, to be avoided. Without first being dried, the pills may be coated at once with varnish or collodion. For the patient they offer the great advantage that they do not yield anything to the saliva, and consequently no unpleasant taste occurs. Furthermore, the pills allow of being kept for some considerable time. The heating and melting of the wax, together with the medication, may, when starch wax is used, often be completely avoided, which is of special advantage when the latter is volatile.

Starch wax has to be kept in bottles well stoppered with good corks, in a cool place well protected from day- and sunlight; the powder is odorless. Only when exposed to daylight for some considerable time does it give out a feeble odor of old beeswax; powder which is well kept proves odorless and tasteless even after the lapse of twelve months.

The powder recommended is a mixture of equal parts of wax and starch. Powder made according to this prescription will usually suffice for all purposes where it has to serve as a base for pills. A similar powder may be obtained with two parts of wax and one part of starch, but this base requires the addition of an organic substance for obtaining the proper consistency.—*Br. and Col. Drug.*

Maceration with Percolation.

PROF. J. U. LLOYD says that his experience is to the effect that it is necessary, in some instances, in order to get the best results, that a moistened powder should macerate for a considerable time before packing it in the percolator. If the material is of large amount, and requires for extraction an aqueous menstruum or dilute alcohol, and is of a gummy nature, great pressure results from the subsequent expansion. Unless this expansion be accommodated before packing the powder into the percolator, the material, if in considerable amount, will become so compact as to retard the passage of the menstruum, or obstruct it altogether.

Another class in which preliminary expansion is necessary contains, as members, drugs yielding an abundance of the red astringents. Regarding these, Prof. Lloyd remarks: "With several of these, I have found a menstruum composed of considerable glycerin to be best adapted, and a favorite mixture, in my opinion, for many of them is glycerin, 2 parts, water and alcohol, of each 1 part, all by measure. When these powders are moistened with this menstruum, their constituents are so readily abstracted as to form a gummy magma, which, if the powder is immediately packed into a percolator, suspends the operation of percolation, but not by swelling the powder. Indeed, there is an opposite effect, and the pow-

der even subsides in the percolator in some instances if in large quantity, settling a considerable distance. This coalescing of the material may form an impenetrable barrier at the bottom, obstructing the act of percolation, which trouble may be avoided by permitting the powder to remain properly moistened for a few hours, then placing it in the percolator without pressure, and without delay starting the percolation. Some powders of this description, among which I would name *Mangifera Indica*, cannot be percolated at all, even with great care, while others, of which *Pinus Canadensis* is a type, by judicious management acquiesce readily.

"Some years ago a set of six glass percolators were made to my order, ten gallons each. Every care was observed in moistening the powders, and allowing them to expand before packing the percolators, but ultimately each percolator burst from expansion of its contents. Some were shattered into small pieces; others split in a line from top to bottom, the rent spreading half an inch or more; none were broken in handling, and none flew into pieces when empty, as glass sometimes does.

"I have learned that in working considerable quantities of drugs, if the powder be fine, and moistened with the proper menstruum and packed tightly, your view is correct. I have also learned that, beyond a certain capacity, glass, which is also desirable in many cases, is an impracticable medium to use for a percolator."—*Western Druggist.*

The Cinchona Plantations of Java.

FROM a recent report of the Soekaboemi [pronounce "sookaboomi"] Agricultural Society of Java, the *Chemist and Druggist* gives an abstract, from which we take the more interesting portions.

The area under cinchona culture, and the number of trees on the plantations, in Java, are, unfortunately, not given in the returns, but we find that, according to the latest official information, there were, in 1888, 10,622 bouws, or about 18,843 acres (1 bouw = about $\frac{1}{4}$ acres), under cinchona culture in Java. The size of the estates differs widely, of course, and the quantities of bark harvested last year in each plantation range from 233,000 lbs. down to 672 lbs. Most of the Java cinchona estates are situated in the western portion of the island—in the so-called "Preangar Regencies" and the Residency of Batavia—and their outturn virtually forms the bulk of the yield of the island. Roughly speaking, we find that Western Java contains 72 plantations, with an actual yield in bark in 1888, so far as the returns go, of nearly 3,300,000 lbs.; Central Java has 19 plantations, returning an aggregate yield of about 400,000 lbs.; and Eastern Java totals up to 24 plantations nominally, with a harvest of about 220,000 lbs. The largest yield of bark obtained on any single private plantation in 1888 was collected on the Soekanegara estate, near Tjiandjoer, in the Preangar, where 233,000 lbs. were gathered; and the smallest at Djasinga, near Buitenzorg, Batavia, which yielded only 672 lbs. It is a remarkable fact that, whereas the highest estimate for the 1888 crop on any single plantation was 179,000 lbs. of bark (on the Soekanegara estate, just mentioned), no less than five estates estimate their yield for 1889 above that figure, the highest—that of the Goenoeng Melati (meaning Jasmine Mountain) estate, in the Preangar—being 270,000 lbs. The average equivalent of sulphate of quinine obtained from last year's crop varies greatly, the highest return having been obtained on one of the smallest estates in Central Java, where the bark analyzed on an average 9.42 per cent of quinine sulphate. Next to this came two small estates, one in Central and one in Eastern Java, the former with 7, the latter with 6 per cent quinine sulphate. The Preangar plantations mostly run from 3 to 4 per cent. It should again be noted that not only do the returns reveal the fact that the estimated yield of bark for 1889 is generally considerably in excess of the actual yield of 1888, but the estimated standard of the bark is also much higher. In 1888, the aggregate estimate of those among the private planters who ventured upon the prediction amounted to 1,860,000, with about 76,590 lbs.* of quinine sulphate, while the actual result was a harvest of 3,171,778 lbs. of bark, containing 122,889 lbs. of quinine sulphate, or an average of 4.14 per cent. For 1889 the estimates are: Bark harvest, 3,600,000 lbs.; quinine sulphate yield, 151,250 lbs.; or, say, an average of 4.20 per cent. The year 1887 was exceptionally humid in Java, and while the moisture was generally favorable to the young plants and those in the nurseries, it had a bad effect upon the old trees and consequently upon the yield of bark.

As already pointed out, the great mass of cinchona grown in Java is produced in the province known as the Preangar Regencies, and occupying the southwestern portion of the island. This province is of a highly mountainous nature, being traversed by two important chains, on the slopes of which, at an altitude of 5,000 to 6,000 feet, and in a temperature rather too low for coffee-growing, the plantations are situated, many of them on the clearings of old mountain forests which have been freed of the high alang-alang grass overgrowing them. The large

* We have altered the figure 7,659 of the original, which is evidently an error, into 76,590.—Ed. Am. Dr.

Government plantations, containing over 1,500,000 trees in the open ground, are also found in this province at Tirtasari, Tjinieroean, and Nagrak, near Bandung. They produced in 1887 nearly 800,000 pounds of bark; their area is being constantly extended, and the old trees replaced by young ones of richer variety. It is now nearly thirty-five years since the first successful attempt at propagating cinchona was made in Java by Dr. I. K. Hasskarl, a German savant, who had held the position of Government botanist in the Buitenzorg Garden, and Mr. F. Junghuhn, who had already made a great reputation in Holland and its colonies as a naturalist and scientific investigator. Although the former was the man who actually brought from South America, after a long and perilous journey, the plants from which the present cinchona trees in Java have originated, to Junghuhn belongs the credit of having carried the venture to a successful issue, and of having so carefully managed the plantations that, when he relinquished their direction, there were no less than 540,000 plants growing in the open and some 620,000 in hot-houses. Exactly twenty-five years ago, on April 24th, 1864, this famous naturalist died at Lembang, in Java, in the centre of the plantations which he contributed to create. Mr. K. W. van Gorkom, one of the subsequent directors of cultures in the Dutch East Indies, in his valuable book on the cultivation of staple products in Java, relates how Junghuhn's grave is placed at the crossing of the two principal avenues of *succirubra* trees in the Lembang plantation, a white needle which has been erected over the burial place being visible at a great distance. In Junghuhn's time two cinchona plantations were also commenced in other parts of Java—viz., Bezoekei in the extreme east, and on the high mountain plateau of Dieng, in Malang, one of the loveliest districts of the island—but neither appears to have been successful.

As regards the cinchona estates belonging to private owners, the report which we have quoted makes mention of two cinchona plantations at Lebak, in the residency of Bantam, but only one of these has sent in a return, and this shows the undertaking not to be of any special importance, the 1888 crop having been only 38,000 pounds.

The first attempt at planting cinchona by a private individual was made in Java in 1866 at Garoet, in the Preangar, a district in which, according to the returns, there are now no less than eleven plantations.

The largest and richest plantations are found in Bandung and Tjiandjoer, the former district containing no less than seventeen and the latter fourteen plantations. The remaining Preangar plantations are found at Soemedang (one), Tasikmelaja (three), and Soekaboemi (five), the latter place being the seat of the Agricultural Society, which was founded, we believe, a few years ago for the promotion of the interests of the Java planters. In the adjoining residency of Cheribou, two plantations have been commenced, but neither of them has yielded any crop as yet, though it is expected that they will produce an aggregate of about 17,500 pounds of 3 to 4½ per cent bark this season.

The plantations in Central Java are nineteen in number, but only four are of any great importance, the foremost among these being the Pagilaran estate, which in 1888 yielded nearly 200,000 pounds of 6-per-cent bark. This estate, with four others, is situated in the residency of Pekalongan, where is found the famous "valley of death," filled with nitrogenous exhalations for some feet above the surface of the ground, and fatal to animal life. Pekalongan is also known as a sugar-producing district. It has been frequently pointed out that, in the present state of the cinchona market, the only salvation for the planter lies in the production of a bark of very high quinine standard, and this is now generally recognized by the Java planters. The two richest plantations in the whole island are found in the Pekalongan residency—one of them, the Karang Mego estate, having in 1888 yielded a bark averaging 9.42 per cent of quinine sulphate, while another produced 200,000 pounds of 6-per-cent bark. In the residency adjoining Pekalongan—that of Samarang, the capital of which, of the same name, is the third most important trading port of the island—there are four plantations, one of which (Langenardjo) produces a very rich bark. The cinchona plantations here, however, are not of much extent, except one at a place called Ambarawa, where the 1888 crop was about 26,500 pounds of 5½-per-cent bark. With one more exception—that of the "Mij Bagelen" estate at Ledok—all the remaining plantations in Central Java are not as yet of much account.

In Eastern Java, which embraces some of the most fruitful and also some of the wildest parts of the colony, there are at present four or five large plantations and several smaller ones, while a few have been abandoned, their cinchona trees in some cases proving almost valueless, while in others the trees have been uprooted to make way for the more profitable coffee cultivation. In the Kediri residency there are eight plantations, but not one of them appears important. In Soerabaya, a residency the capital of which is the second largest, if not the largest, trading port of Java, there are thirteen plantations, most of which are situated on the magnificent highlands of Malang, a plateau which is surrounded, as it were, by a circle of volcanoes, including the Sméroe, the highest mountain of Java, rising 13,000 feet above sea-level, and the Bro-

mo, an active volcano, which is regarded with superstitious dread by the Javanese as the haunt of the spirit of the Indian Sea, Ratoe Kidool.

HOW TO TAKE PHOTOMICROGRAPHS.

NOTICING in the discussions upon two papers, recently read before the Chemists' Assistants' Association, that an interest was evinced in photomicrography, I thought a short description of a simple and inexpensive apparatus, which, in my hands, has answered every purpose for some years past, might not be out of place in the columns of this journal [*Pharm. Journ.*].

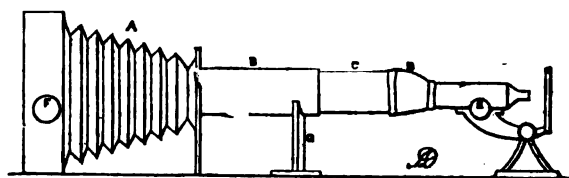
I may state that the apparatus was devised by myself, and although I believe all new apparatus are recorded in the Journal of the Royal Microscopical Society, I know of none so inexpensive, and at the same time so useful, as this has proved itself.

The following diagram illustrating my apparatus is almost self-explaining.

A is the camera; any fairly good quarter- or half-plate camera will answer the purpose.

B is a zinc tube, diameter about 2 or 2½ inches, length 8 or 10 inches. It is fixed by a flange at one end to a board made to fit the front of the camera, in the same way that the board which ordinarily carries the lens is fixed to it.

C is a second zinc tube of about the same length as the tube B, and telescoping into it. The joint must be made light-tight by lining the end of tube B with velvet. The tube C should have a narrow flange at one end. These tubes can be made by any coppersmith.



D is a bag made of at least two thicknesses of velvet. It is fixed, light-tight, over the flange of tube C, by means of tape or elastic. It is also fixed light-tight to the tube of the microscope in the same manner.

E is the microscope. Any monocular instrument will do. It is best used without an eye piece. The better the objective used, the better, of course, will be the photograph.

The *modus operandi* is simple. The object is placed upon the stage in its usual position; when lighted and focussed, the enlarged picture will be thrown upon the screen of the camera.

The adjustment can be made:

1. By the rack and pinion of the camera.
2. By telescoping the tube C into the tube B.
3. By pushing the microscope further into C.

In this manner, an enlarged picture of almost any size can be obtained, for the greater the distance between the objective and the screen, the larger will be the picture. If it is desired to produce a series of photos to the same scale, this can be done by using the same objective at the same distance from the screen in each case.

If one of the objects has been measured and its diameter compared with the diameter of its photograph, the amplification in each case will be the same if the above conditions are adhered to, and it will be unnecessary to repeat the measurement at each distance.

The fine adjustment can be made by the focussing arrangement of the microscope E, but when photographing to scale it would be necessary to make the tube of the microscope rigid by fixing it to a support similar to that marked G, so that, in focussing, the objective remains immovable, while the stage is free to move in either direction.

A slight inconvenience may at first be felt in reaching to E in focussing; after a little practice this gives no great trouble, and might be entirely obviated by connecting E with a grooved wheel, F, by means of a band, in which case it would be necessary to make both the microscope and the camera rigid.

A strong light is necessary for lighting the object. I have found a good size Hink's duplex lamp answer every purpose. In lighting an opaque object, I direct the light into the object in the same way. For special work a more refined method of lighting might be required, but this plan will be found to answer most purposes.

I do not think it necessary to give details of photographic and microscopic manipulation, as they differ in no respect from those in ordinary photographic and microscopic work.

The cost of adapting an ordinary camera and microscope for this work should not exceed half a crown, whilst a quarter-plate camera suitable for the purpose (which would also be useful for general photographic work) can be purchased for a guinea or upwards.—J. C. SHENSTONE in *Ph. Journ.*

Donovan's Solution.*

BY E. GOODMAN, PH.G.

THE article in question is one of five years' standing—that is, it has been standing about that long in a shelf bottle, not conspicuously exposed to the light. Incidentally my attention was attracted to it by the deepened color and by a precipitate having made its appearance. Being solicitous to ascertain whether I alone enjoyed such perfect immunity from dispensing so potent a remedy, I canvassed the city on the subject, with the following result: About fifty retail druggists were spoken to in every part of the city, across the river, and in the suburbs to a distance of six miles. Without exception they all said it was very little called for. Some were more specific. One druggist could only recall two prescriptions for it in five years; another made up a pint three years ago and had it all yet; still another had last made it about six years ago, and had some of it still. I feel safe in asserting that the demand for it per druggist in our vicinity would not average one a year.

Several physicians were also asked whether they prescribed it often. Quite a number answered that they gave Fowler's Solution the preference; another thought that the efficiency of the arsenical preparations was overrated, and he seldom used them; one was found whose patient had increased the dose from five to twenty drops without deleterious effects, and still another used it as an ingredient in his "sarsaparilla" for the market.

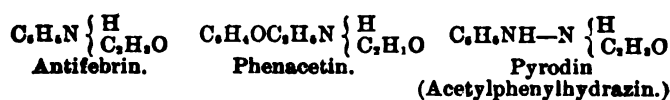
With these preliminary remarks on the frequency of its use, let us now consider the preparation itself. The specimen in question had precipitated mercuric iodide, had darkened to a brownish-yellow by the liberation of iodine, and consequently the arsenic was converted into arseniate. I am aware that the mention of these changes is not in the nature of a revelation, but my object was to ascertain the extent of the changes. The supernatant liquid was filtered from the precipitate and each weighed. The filtrate weighed 255.14 Gm., while the mercuric iodide, after being perfectly dried on the filter, weighed .1134 Gm., amounting to a loss of mercuric iodide of nearly 4.5 per cent. The amount of free iodine was volumetrically estimated at 4.9843 Gm., or nearly 2 per cent. The amount of mercury remaining was gravimetrically estimated as sulphide, and the iodine gravimetrically estimated as iodide, while the arsenic was estimated by difference.

The unstable properties of the solution are directly attributable to the loose affinity existing in the iodide of arsenic, in the commercial article of which the elements are often found partially disassociated, thus introducing free iodine into the solution from the start; this exerts a double action, throwing out of solution a corresponding amount of mercuric iodide.

In the course of my experimenting, I caused about all the mercuric iodide to be deposited from a portion of the solution, by boiling the latter with hydrochloric acid and chlorate of potassium, whereby the iodine was liberated and the red iodide thrown out of solution. The presence of the free iodine also exerts its oxidizing influence on the arsenious acid. The only remedy, of preparing the solution extemporaneously by commencing with the elementary substance, the arsenious iodide, seems impracticable, considering that only two to four drachms are prescribed every year or two in this part of the country. If the points made will have any bearing with the revision committee, in considering whether the remaining followers of Dr. Donovan shall have any further recognition, and, if so, if it cannot be accomplished in a more practical manner, the objects of this paper will have been accomplished.

Hydracetin or Acetylphenylhydrazin.

AT the close of last year a new antipyretic, called pyro-din, was introduced into therapeutics from Manchester. Professor Dreschfeld, who first reported favorably on this new remedy, shortly afterwards recommended caution in its administration, as it appeared to be a mixture of several substances, and not a pure acetylphenylhydrazin. The pure preparation was said to have four times the strength of pyro-din. Professor Liebreich fixes the single dose for the latter at $\frac{1}{4}$ to 1 grain for children and at 2, or at the utmost 3, grains for adults. He also advises cautious administration until a pure preparation of constant strength is obtainable. Analytical and manufacturing chemists have, consequently, applied themselves to produce and examine new substances containing the acetyl group with other substances in close relation to antifebrin and phenacetin. The complex atom $N \begin{smallmatrix} \text{H} \\ \text{C}_6\text{H}_5\text{O} \end{smallmatrix}$ was thought to be the essential basis of the antipyretic action. It forms part of antifebrin, phenacetin, and pyro-din. The close chemical relation of the three substances may be seen from the following formulæ:



For some time the matter has been dropped, but quite lately Professor Guttman, director of the well-known Moabit Hospital in Berlin, read a paper to the Berlin Medical Society on his experience with pure acetylphenylhydrazin, which had been submitted to him under the name of *hydracetin*. It consists of a white, crystalline, odorless, and nearly tasteless powder, soluble in water in the proportion of 1 in 50; readily soluble in alcohol. Guttman found the remedy sufficient with eighteen patients suffering from febrile diseases; the temperature abated after administration of $1\frac{1}{2}$ to 2 grain doses. He also treated with the new remedy eight cases of rheumatic fever and two cases of sciatica. The results were very satisfactory. He thinks the new substance suitable for occasional but not for continued administration. The daily dose for an adult (best given in two single doses) should not exceed 10 centigrammes (not quite 2 grains) either in fevers or rheumatism. To continue the administration for more than three days consecutively is unadvisable, as it might produce symptoms of poisoning. The antipyretic action of hydracetin is thought to be in connection with its reducing properties. The latter is proved by several reactions. Permanganate is discolored, metallic silver is precipitated out of a solution of the nitrate, and red suboxide of copper is precipitated even from a cold alkaline copper solution. Based on these reducing properties, a 10-per-cent ointment has been prepared for inunctions, which was very successfully applied in two cases of psoriasis.—*Chem. and Drugg.*

Ammonia in Distilled Aromatic Waters.

PROF. SCHLAGDENHAUFFEN, of the Nancy College of Pharmacy, while examining some fenugreek-seed water of his own make for its volatile principles, was surprised to observe the characteristic reaction of ammonia and its compounds when adding to the distilled product an alkaline solution of iodohydrargyrate of potassium. On repeating the operation with great care, not only was the same effect produced, but it was equally evident with the water distilled over various other substances. Moreover, upon evaporating the distillates, acidulated with muriatic acid, crystallized ammonium chloride could easily be separated. Fifteen different plants were thus tried, such as pyrethrum tops, mustard seed, angelica seed, peas, beans, orris root, star-anise seed, etc., and afforded a proportion of chloride varying between the minimum and maximum of 0.03 to 1.10 per thousand. Without attaching too much importance to the facts, in the present stage of his experiments, the professor merely suggests that the presence of ammonia in distilled waters must be the cause, or one of the causes, of their alteration on keeping; that it is always to be found in such waters, and they would keep better if this natural food of micro-organisms could be left out.—*Chem. and Drugg.*

A Hint for Facilitating the Microscopic Examination of Urine.

WHEN attempting to examine urine under the microscope for casts, epithelial cells, and other organic bodies, a good deal of annoyance and difficulty is sometimes caused by urates and also, when the specimen is not quite fresh, by fermentative and putrefactive products. In order to obviate this difficulty, and with the further view of preserving the specimen, Dr. M. Wendringer advises that the urine should be mixed with a nearly saturated solution of borax and boric acid. This dissolves the urates and keeps the urine from fermenting, and at the same time exercises no destructive effect upon the casts and epithelial elements which it is desired to examine. The solution is prepared by adding 12 parts of powdered borax to 100 parts of hot water, and then adding a similar quantity of boric acid, stirring the mixture well. It is filtered while hot. On long standing a small deposit crystallizes out, but clings to the side of the vessel, so that it does not interfere with the transparency of the liquid. The urine to be examined is put into a conical glass, and from a fifth to a third of its bulk of the boracic solution added to it and agitated with it. The urine will be found to become clear in a short time—i. e., if there is no cloudiness due to bacteria—and it will remain unchanged for several days. If it is only wanted to clear the urine and to make it keep for a day or two, the addition of a smaller quantity of the boracic solution is sufficient. If a third of its bulk is added, no fermentative or putrefactive processes take place, even if the glass is left uncovered in warm places. Albumen, too, if it exists, is not coagulated. The organic elements—as epithelial cells, casts, blood-corpuscles, etc.—collect so quickly, without undergoing any morphological change at the bottom of the glass, that the first drop taken up by the pipette usually proves a satisfactory specimen.—*Chem. News.*

[Chloroform and chloral hydrate have also the property of preventing fermentative changes and the rapid disappearance of casts under the influence of bacteria. It is the practice of some physicians to add a few drops of eosin ink to any specimen of urine to be examined, for the purpose of staining the casts and rendering them more easily discernible.—*ED. AMER. DRUGGIST.*]

* Paper read at the meeting of the Amer. Pharm. Assoc. at San Francisco.

Alkaline Mercurial Treatment in Yellow Fever.

DR. GEORGE M. STERNBERG, of the U. S. A., publishes a paper in the *Therapeutic Gazette* (1889, 298), in which he reports that very good results in many cases of yellow fever not too far advanced, had been obtained by administering small doses of bichloride of mercury in conjunction with bicarbonate of sodium. The formula which he finally settled upon is the following:

R Sodii Bicarbonatis.....gr. 240
Hydrarg. Chlor. Corros.....gr. †
Aque puræ.....fl. 3 83

M. Give 1½ fluidounces (*ice cold*) every hour during the day, and every two hours at night.

The quantity of sublimate, as well as the amount of water (*ice cold*) to be added to each dose, will of course vary according to the age, sex, and condition of the patient. The dose above given is that for a male adult of average condition.

Changes of Acetanilide in the Human Body.

THE urine of patients taking acetanilide (antifebrin) is, as Müller first observed (*Deutsch. med. Wochenschr.*, 13, 27), red, from excess of urobilin. The amount of ethereal hydrogen sulphates in the urine is increased, and the urine reduces alkaline solution of cupric oxide and is strongly laevorotatory. K. A. Mörner has more fully examined this subject, the following being a condensed abstract of his results: The urine was evaporated to a syrup, extracted with 90-93 per cent alcohol; to the extract half its volume of ether was added, and then a warm concentrated alcoholic solution of oxalic acid. The potassium ethyl oxalate and the ethereal hydrogen sulphate form a compound which can be crystallized and purified by recrystallization.

On taking antifebrin, a part of it is oxidized to form paracetamidophenol, and is excreted as an ethereal sulphate; whether other similar acids are formed it is not at present possible to say.

The strongly laevorotatory reducing substance is probably a derivative of glycuronic acid. — After *J. Chem. Soc.*

Examination of Extract of Malt.

SOLID matter is determined in 2 Gm.; the dried extract serves for determination of the ash, and this latter for determination of the phosphoric acid. Free acid is determined by titrating a solution of 10 Gm. of extract in about 50 C.c. of water with semi-normal ammonia, using delicate litmus paper. In order to determine the albuminous substances, 2 Gm. of extract are well dried, and the nitrogen determined by Kjeldahl's method and multiplied by 6.25.

Maltose.—A solution of 1 Gm. of malt extract is made up to 100 C.c., and the maltose determined gravimetrically and volumetrically by Fehling's solution. The result is only approximate, owing to the presence of other substances, *e. g.*, dextrin, which reduce Fehling's solution. The error due to the small quantity of dextrin in good malt is, however, not of much moment.

Dextrin.—To a solution of 5 Gm. of extract in 25 C.c. of water are added slowly 400 C.c. of absolute alcohol, the whole being kept well stirred. This is allowed to stand for 12 hours and is then filtered; the residue is washed with alcohol dissolved in 60 C.c. of water, boiled, filtered, cooled, and made up to 100 C.c.; 50 C.c. of this are titrated with Fehling's solution. The remaining 50 C.c. are heated for three hours on a water-bath with 0.5 C.c. of hydrochloric acid, then neutralized carefully with caustic soda and titrated with Fehling's solution. The difference of the two titrations is calculated as dextrin.

Diastase.—Into a number of test tubes are introduced 10 C.c. of a 1-per-cent starch solution; to the first tube is then added 0.2 C.c. of a 10-per-cent malt extract solution, to the second 0.3 C.c., and so on. The tubes are then heated for three hours to 60° on a water-bath, and are then tested for starch by adding a drop from each to an iodine solution. The percentage of diastase may be ascertained from the fact that one part of diastase decomposes 2,000 parts of starch. — E. DIETERICH in *Helfenberg. Annal.* (*J. S. Chem. Ind.*).

A New Mydriatic.

SOME recent researches upon hydronaphthylamine by Messrs. Bamberger and Müller (*Berichte*, XXI., 1112) would appear likely to result in another useful contribution from the chemical laboratory to the materia medica. The compound in question bears the systematic name tetrahydro-beta-naphthylamine (C₁₀H₉NH₂), and appears, among other interesting physiological properties, to be capable of causing the dilatation of the pupil of the eye in a remarkable manner. According to Professor Filehne, of Breslau, the instillation of a drop of a one to five-per-cent solution causes the dilatation of the pupil of the eye treated only; but dilatation takes place to a strong degree in both eyes as soon as a sufficient quantity—still very minute—has become absorbed in any way; as, for instance,

after subcutaneous injection. The pupils are dilated wider than by atropine, and a pupil already dilated by a maximum dose of atropine is still further dilated by this substance. The physiological action of the tetra-hydronaphthylamine is not identical with that exerted by the tropeines in the production of mydriasis, since, when applied locally, instead of paralyzing the contracting muscles of the pupil, as the tropeines do, it stimulates the nerve-endings with the dilating mechanism. — *Pharm. Journ.*

Note on Cod-Liver Oil.

DR. H. UNGER, of Würzburg, has made further studies on cod-liver oil, which are contained in a paper published in the *Pharm. Centralhalle* (1889, No. 17). He investigated three specimens of oil, prepared in 1888 from the same lot of livers. It was found that cod-liver oil contains albuminate of iron, which is gradually altered or decomposed by fermentative processes. The iron is held in a much more intimate combination than can be obtained by any artificial means.

As a result of the investigation the following facts may be quoted:

1. Cod-liver oil contains manganese. This was found in the ash, amounting to 0.0016 per cent of the oil.

2. The phosphorus contained in the oil, as well as the iron and manganese, are combined with albumen.

3. The albuminoids may be separated from the oil by shaking it with water, or more easily and completely by mixing the oil with water and passing carbonic acid gas through it.

4. Medicinal cod-liver oil should contain the natural albumen compounds in an undecomposed condition.

The author proposes the following pharmacopoeial requirements:

Cod-liver oil should be fresh, should contain not more than 4.5% (perhaps this is still too high) of free fatty acids, and, when poured upon nitric acid of spec. grav. 1.400, should exhibit a white zone of albumen after five hours.

A Ready Method for Emulsions.

HECKER makes some interesting communications on emulsions in the *Pharmaceutische Post*. The use of gum in the shape of a powder, as generally adopted for preparing emulsions, is, according to his experience, not suitable for emulsifying balsams, resins, essential oils, and ethereal extracts. For such purposes he prefers the official mucilage of arabic gum, with the addition of some sugar. Even in the case of fatty oils, such as almond, poppy, and castor oil, when prepared according to the latter prescription, a much more constant emulsion will readily be obtained, and it need not be feared that, after the lapse of twelve hours, the preparation will separate into two layers. The following are the proportions of the different ingredients for 2 drachms of the oil to be taken:

Castor Oil: 2 drs. mucilage, 1 dr. powdered sugar.

Almond Oil, poppy, olive, cod-liver oil, 2 drs. mucilage, 1 to 2 drs. of powdered sugar.

Essential Oils: 5 drs. of mucilage, 2 drs. of powdered sugar.

Copaiva and Peru Balsam: 3 drs. of mucilage and 1 dr. of sugar.

The ingredients are, without reference to order, placed in a cup, and stirred with a broad-headed pestle until the peculiar sound of "crepitation" is heard, this being a sure sign that the emulsion has been successfully made. Slowly and gradually water is added. Afterwards the emulsion is poured into a gauged glass containing the other ingredients prescribed. This method of making emulsions is especially convenient for night duty, and for all such cases where rapid making is essential; the preparation of such an emulsion does not require more time than is necessary for making an ordinary mixture. The addition of sugar might be objected to, but an exact following may be assured by subtracting the amount of powdered sugar from the ordinary syrup usually prescribed with such emulsions. — *Br. and Col. Drug.*

Salol as an Antiseptic.

JUST as antipyrine, after its original application, was found to have numerous other equally effective uses, so it is now with salol, which seems therefore likely to command a more extensive patronage. One of these seems to be really important. The antiseptic properties of the compound have always been recognized, but salol had never been applied externally. Now, however, continuing the parallel with antipyrine—the most important property of which was discovered in a country other than that in which it was first used—salol has been proved to be a valuable antiseptic in France, Italy, and Switzerland. It is specially recommended as a substitute for iodoform, in all cases in which the latter has been previously used, and, considering its freedom from objectionable odor, it is not astonishing that its application in this direction should find favor. Moreover, it is not toxic, which is more or less the case with iodoform. Another advantage is that it is about 20 per cent cheaper than iodoform. — *Chem. and Drugg.*

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FREDERICK A. CASTLE, M.D.....EDITOR.
CHARLES RICE, Ph.D.....ASSOCIATE EDITOR.

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EDITORIAL.

A RECENT addition to the number of pharmaceutical journals, which is issued in Oregon, contained in one of its first numbers an article by Chas. E. Black, Ph.G., purporting to be original, on the subject of "The Decoration of Drugstore Windows," which was really almost a verbatim copy of an article which first appeared in the AMERICAN DRUGGIST for December, 1884.

While Mr. Black's selection demonstrated the fact of his being a contemptible plagiarist, it also indicated his good taste, for the article as it appeared in the AMERICAN DRUGGIST was one of a series, was prepared by a prominent art critic, and the illustrations which accompanied it were by a well-known New York artist. The whole series attracted such universal attention, both in this country and abroad, that the issues containing them were soon exhausted and a reproduction in book form has been contemplated.

It has been a matter of no little satisfaction to the editors of the AMERICAN DRUGGIST that their efforts in directing the attention of the profession to the desirability of breaking away from the old humdrum methods in regard to the details of drugstore fitting and furnishing, and keeping more closely abreast with the advancing ideas surrounding them in other lines of business, and for the first time broached in the articles mentioned, have been productive of good results, as indicated by the interest these articles created wherever the AMERICAN DRUGGIST was read.

While some of the designs have been widely copied, and many of the ideas practically utilized, it is not surprising that the articles themselves should be caught up by unprincipled scribblers for use as original compositions of their own. But how any well-informed editor could have been so cheaply caught is yet to be explained.

WE resume, in the present number, the publication of this series of papers, and will give some interior designs which show a very considerable advance in the artistic character of the fittings to be found in recently constructed stores in New York City.

WE occasionally pass stores in which the occupant shows a most lamentable want of taste in disposing his stock to best advantage. Goods which are in themselves attractive are jumbled together with no more regard to the impression that they may produce upon the passer than is shown by the teamster who unloads a lot of building materials, and we are led to wonder that any one can have so little regard for his business interests.

American Pharmaceutical Association.

BEFORE going to press we are enabled to give a list of the new officers of the Association who were elected for the ensuing year at the annual meeting at San Francisco:

President: Emlen Painter, of New York. Vice-Presidents: Karl Simmon, of St. Paul, Minn.; W. M. Searby, of San Francisco, Cal.; J. W. Eckford, of Aberdeen, Miss. Permanent Secretary: J. M. Maisch, of Philadelphia, Pa. Treasurer: S. A. D. Sheppard, of Boston, Mass.

We have received an abstract of the proceedings, and also copies of the papers read. A few of the latter will be found in this number. The proceedings in full appear in a supplement to this issue. The next meeting of the Association will be held at Old Point Comfort, Va., on Sept. 8-12, 1890.

WE are pleased to acknowledge our indebtedness to Secretary Hopp, of the Ohio State Pharmaceutical Association, for copies of the papers presented at the recent annual meeting.

THE excursionists to the meeting of the American Pharmaceutical Association at San Francisco have evidently every reason to be satisfied with their trip and their reception *en route*. On June 16th, the excursion parties arrived at Denver, and were suitably received by the Denver Association, a committee of which, consisting of Messrs. Scholz, Prowitt, and Dingle, went some distance down the road to meet their guests. Every attention appears to have been paid to the latter, to judge from the reports received. The enterprise of the Denver press is most strikingly displayed by the insertion into their reportorial articles of very characteristic and almost life-like "portraits" of prominent members of the Association. We have no doubt that the collection of "portraits" will be considerably enlarged before the party returns to the East.

New York State Pharmaceutical Association.

The eleventh annual meeting was held at Binghamton, June 4th to 6th.

An address of welcome was delivered by the mayor, Mr. F. H. Stephens, which was responded to by Dr. J. H. Eaton, of Syracuse. Dr. J. G. Orton welcomed the Association on behalf of the medical profession, and his address was replied to by Dr. A. B. Husted, of Albany. On the first day the president, Dr. R. G. Eccles, read his annual address, which was referred to a committee.

The reports of the several officers and committees were then offered.

Among the latter was the report of the Committee on Adulterations, which was read by Dr. Eccles.

A committee was appointed, consisting of W. H. Rogers of Middletown and J. H. Eaton of Syracuse, to select five candidates to be proposed to the governor of the State for selecting a member for the State Board of Pharmacy.

On the second day, this committee reported the following names: E. G. Dawson, Jr., of Syracuse; F. M. Frank, Middletown; R. E. Phillips, Fulton; C. H. Sagar, Auburn; J. B. Todd, Ithaca. At the same time they recommended that a resolution be passed petitioning the governor to appoint Mr. Dawson, which was carried.

Dr. R. G. Eccles, T. J. Macmahon, and Clay W. Holmes were appointed a committee to represent the Association at the next convention for revising the Pharmacopoeia (May, 1890).

The following were elected officers for the ensuing year: President: Prof. W. G. Gregory, of Buffalo. Vice-Presidents: C. S. Ingraham, of Elmira; Wm. Howarth, Jr., of Utica; C. H. Gaus, of Albany. Secretary: Clay W. Holmes, of Elmira. Treasurer: C. H. Butler, of Oswego. Executive Committee: F. L. Norton, of Delhi; W. L. Du Bois, of Catskill; J. B. Todd, of Ithaca.

The next meeting was decided to be held at Auburn, at a time to be fixed by the Executive Committee. Mr. C. H. Sagar, of Auburn, was appointed Local Secretary.

On the third day several further committee reports were read, and also a number of papers.

During the meeting fifty-three applications for membership were received.

After the new officers had been installed, votes of thanks were tendered to the pharmacists of Binghamton, as well as to others who had extended courtesies to the Association.

The meeting then adjourned.

The Ohio State Pharmaceutical Association, in its meeting on the 4th of June, elected the following-named officers: President, L. Sherwood of Columbus; Vice-Presidents, A. H. McCullough of Mansfield, F. M. Heath of White House; Treasurer, F. A. Kautz of Cincinnati; Executive Committee, P. Acker of Cleveland, J. H. Von Stein of Sandusky, M. A. Burkhardt of Dayton. The next meeting will be held at Toledo on the second Tuesday in June next. The following nominees were chosen for the vacancy in the State Board of Pharmacy: C. Ludlow, Springfield; F. M. Heath, White House; and E. M. Hatton, Zanesville. Article 3 of Chapter III. of the by-laws was amended so as to read: "and the president, upon the report of said committee, shall call for additional nominations."

The Wisconsin Pharmaceutical Association will hold its tenth annual meeting at Portage on the 13th, 14th, and 15th of next month, and the local committee have made provisions for numerous entertainments during the session. Besides the usual business an entertainment will be given on the evening of the 13th by the commercial travellers and members of the Association. On the evening of the 14th there is to be a reception and ball, and on the 15th an excursion will be made by railroad and steamboat to the Dells—a narrow passage cut by the Wisconsin River through sandstone rock for seven or more miles, and noted for its picturesque scenery and curious sights.

The School of Pharmacy of the University of Kansas celebrated its fourth anniversary in Lawrence on the 3d of June, and was followed by the business meeting and banquet of the Alumni Association in the afternoon and evening.

The Committee of Arrangements for the thirty-seventh annual meeting of the American Pharmaceutical Association issued a beautiful forty-page pamphlet describing the matters of interest in and about San Francisco, and profusely illustrated.

Fastening for Envelopes.—To prevent the unwarranted opening of envelopes it is recommended that copper oxide ammonia solution be used instead of gum. This solution has the property of dissolving cellulose, and when applied to paper slightly corrodes its surface. When the paper becomes dry, the fastening is secure. It may also be used for parchment paper. —*Brit. and Col. Drugg.*

CORRESPONDENCE.

Eucalyptus Honey.

EDITOR OF THE AMERICAN DRUGGIST.

SIR:—For some time a doubt has been expressed as to whether the eucalyptus honey sent over from Australia is a natural product, and, as we have taken a large share in the introduction of this article into Europe and the United States, we feel called upon to give, for the benefit of those whom it may concern, all the information we have received up to date.

The first that was heard of this honey in Europe was through the *Progrès Médical* of Paris, August, 1885, in which an article was published by Dr. Caraman-Thomas giving the chemical analysis and therapeutic information he had obtained by personal experience. Since then, however, we received from South Australia a large consignment of the honey, and we have distributed samples in the States and in this country. A doubt, however, was cast upon the nature of this honey, and it was openly asserted that no such product as eucalyptus honey was obtainable in a natural state. Immediately on hearing of this statement, we communicated with competent authorities in Australia with a view to ascertain how the case really stood. Our informant in Adelaide said that he had made inquiries of the chemists, who knew nothing of this honey, and that he feared it was an artificial product probably made up with eucalyptus oil. From Melbourne a more interesting account was sent, reading as follows:

"A few months ago some honey was sent to me for my opinion that was taken from bees that visited the flowers of the *Bursaria spinosa* in Kangaroo country, and which had a strong aromatic taste. Besides, I have often been told that honey taken from bees visiting the eucalyptus flowers has their characteristic taste. My own opinion

is that such honey is not extracted from the flowers themselves, but from a manna which very often covers the leaves of the flowering and other eucalyptus trees, especially the *E. rostrata*; and this manna gathers in large drops under the thin, peeling bark, so that it flows away, even covering the ground. This fluid manna has a strong eucalyptus and agreeable taste, and is licked up by the bees and ants. In such cases the honey imparts its taste and aroma to a whole hive. In the olden times of the colony, I have often observed swarms of the small Australian bee (probably related to the *Melipana* of South America) on grass and corn, but was never fortunate enough to find a hive filled with honey, though others have assured me of having done so."

The whole of the information we received has been published in the *British and Colonial Druggist*, April 20th, 1889, of which we forward you a copy by this post. Since this article we have, however, received further and definite information from the shipper of the honey, from which it would appear that eucalyptus honey is undoubtedly a natural product, notwithstanding anything that theorists may advance in opposition to it. The statement made by a number of gentlemen of undoubted authority in S. Australia, and who are thoroughly competent to speak on such a subject, leaves no loophole, and we ask you to grant us a portion of your valuable space in order that your readers' minds may be set at rest on this subject. We may inform you that we have been induced to write to you, having received from our friends in the States several letters urging us to reply to paragraphs reproduced in your contemporaries from the *American Journal of Pharmacy*.

Yours truly,

THOS. CHRISTY.

25 LIME ST., LONDON, June 1st, 1889.

ADELAIDE, 6th April, 1889.

We, the undersigned, having visited the apiary of Mr. E. A. Coleman at Fairfield, Mount Barker, have no hesitation in stating that Mr. Coleman's honey crop is gathered entirely from the various eucalyptus trees which grow in his neighborhood.

It is well known that in the wooded districts of South Australia, such as Mount Barker, the bees are entirely dependent during the summer months on the eucalypti for the supply of honey, and that were it not for these trees the honey crop would be a failure. We can also state, from our personal knowledge of Mr. Coleman, that honey from his apiary can be thoroughly depended upon to be in all respects as he represents it; that is to say, an absolutely pure natural product without any admixture whatever.

J. E. RAMSAY, Chief Secretary, S. A. (South Australia).

J. M. A. COCKBURN, M.D., Lond., M.P.

A. WATSON, M.D., Paris and Göttingen, Elder Prof. of Anat., Adelaide Univ.

ALBERT MOLINEUX, Sec. Bureau of Agr.; Editor *Garden and Field*; Agr. Ed. *Observer*.

C. G. GURR, Sec. S. Australian Beekeepers' Association.

Solution of Citrate of Sodium.

AMERICAN DRUGGIST.

DEAR SIR:—In your May number (p. 100), you gave a formula for sol. of citrate of sodium to contain 7% citrate of sodium, and to take the place of the salt in the National Formulary, under "Tinctura Ferri Citro-Chloridi."

The proportions as given are incorrect, there being not enough sodium bicarb. and a large excess of citric acid.

The citrate of sodium intended is evidently the granular salt, $\text{Na}_2\text{C}_6\text{H}_5\text{O}_7\text{H}_2\text{O}$, and is not the crystallized citrate as given by Remington, $2\text{Na}_2\text{C}_6\text{H}_5\text{O}_7\cdot 11\text{H}_2\text{O}$, for a solution prepared to contain 7% of the salt of the last formula will not give the reaction required.

By using the following, a solution can be made containing 7% of the citrate of sodium, $\text{Na}_2\text{C}_6\text{H}_5\text{O}_7\text{H}_2\text{O}$:

Bicarb. Sodium, 99% pure.....	2,896 gr.
Citric Acid.....	3,847 gr.
Water.....	6 oz.

Dissolve the citric acid in the water, heated gradually. Then add soda gradually, and, when reaction has ceased, add sol. chlor. iron, and complete as per directions in National Formulary.

Yours,

FRANK EDEL.

LEAVENWORTH, KAN.

Filing Prescriptions.

F. V. KNIEST says, in the *Western Druggist* for May, that he has used the following method for filing prescriptions, and found it satisfactory: Beginning with the first 100 prescriptions, pass a very strong piece of twine through their upper right-hand corner, and attach to it, on each side, a heavy piece of card-board a little larger than the prescriptions. Tie the two ends of the twine loosely against the prescriptions, leaving a few inches of the ends. On the outside of both cards write plainly the beginning and closing numbers, also the beginning and closing dates. Construct each succeeding hundred in the same way, and with the ends of the twine connect it with the preceding series. When a thousand have been so arranged, place them in a suitable box, recording on one end the beginning and closing numbers and dates.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,336.—Sozodont (W. W. A.).

According to Schaedler, sozodont consists of the following ingredients: 1. The liquid: 5 parts of castile soap, 6 of glycerin, 80 of alcohol, 20 of water, flavored with a few drops of a mixture of oil of peppermint, cloves, cinnamon and star anise, and slightly tinted with cochineal. 2. The powder: A mixture of powdered orris root, carbonate of calcium, and magnesia.

No. 2,337.—Morrhual (J. C. S.).

Morrhual is the name given to a sort of "extract of cod-liver oil," in which the reputed useful constituents, such as iodine, bromine, and phosphorus, are accumulated in greater proportion than in the original oil. It is prepared by treating brown cod-liver oil with alcohol of 70 per cent, and removing the alcohol from the separated alcoholic solution by distillation. The product is said to represent the original oil in the proportion of 1 to 30. Morrhual is recommended in doses of 3 grains, put up in capsules.

No. 2,338.—Volumetric Solutions (R. A. R.).

Part of your query has been answered in our last issue, incidentally, while speaking of volumetric sulphuric acid (see p. 119). A fuller reply will be furnished in our next issue.

No. 2,339.—Sulphuric Acid (R. A. R.).

We are asked whether there are any other special works on sulphuric acid besides that by Lunge, and whether there are any journals devoted to the subject.

We can mention the following works in English: 1. Lomas, "Manual of Alkali Trade," London, 1886 (ab. \$7.50). 2. Lock, "Practical Treatise on the Manufacture of Sulphuric Acid," London, 1879 (ab. \$7.50). There are several large works on the subject in German and in French, the titles of which our correspondents may learn by writing to B. Westermann & Co., or G. E. Stechert, of New York.

There are no special journals devoted to the alkali and acid manufacture. But the *Journal of the Society of Chemical Industry* gives account of everything new relating to these subjects, and is probably the best periodical, in English, to consult for those who are interested in the acid trade.

No. 2,340.—"Bouquet" and "Aroma" of Wines (K., Ithaca, N. Y.).

"Bouquet" and "aroma," as applied to wines, are not synonymous, though they are closely related. It is rather difficult to give a concise and exhaustive definition of what a connoisseur understands under *bouquet*. But as the property or character to be described by this term is quite definite, we will give as exact a definition as appears to us possible.

"Bouquet," as used of wines, is the total impression produced by a wine upon the sense of odor and taste. This impression is most vivid if the taste and odor of the wine are examined immediately on breaching a cask or opening a bottle, provided the sense of taste and smell of the experimenter is in a healthy, normal condition. Bouquet is not an odor or taste pre-existing in the grape or the unfermented grape juice, but is developed during the process of fermentation and the subsequent ageing of the wine. If the original grape had a decided special odor or taste, such as the muscatelle, Concord, scuppernong, etc., the wine will possess this odor or taste to a certain degree likewise, but this is then called "aroma," not "bouquet." What the substances are which impart "bouquet" to a wine is not known. Certainly they are present only in most minute quantity. While it is possible to deprive grapes of odorous and aromatic principles constituting more or less of their "aroma," by treating them with ether, it is impossible to extract from them any substances which go to make up the "bouquet." These latter occur not only in the grapes, but also in other parts of the vine. The more refined the latter is by cultivation the finer will be the bouquet. A "Riesling bouquet," for instance, has been produced (by Müller, of Thurgau) by allowing sugared water to undergo fermentation upon leaves of a Riesling vine. There is as much variety and "character" among "bouquets" of wines as there is among other classes of odors and tastes. To an uneducated tongue many wines taste practically alike, while a competent judge will readily select from such a series the best qualities, and will not seldom even be able to name the year in which the wine was grown.

No. 2,341.—Prescription Difficulty (F. E. E. H.).

This correspondent writes as follows:

"How may the following prescription be best prepared:

B. Acidi Salicylici	3 1
Sodii Boratis	3 4
Cocaine Hydrochloratis	gr. 2

"M. Fiat pulvis.

"I find that a reaction takes place, and that a mass is formed which on standing hardens again and can be powdered. I suppose the proper way would be to heat the borax until the water of crystallization is driven out. Or should I notify the physician who prescribed it, and find out if he intended to obtain the above result?"

First, regarding the reaction, we would say that this has long been known to take place between salicylic acid and borax in the presence of water. In 1875, Dr. Bruno Hirsch announced that if 1 part each of these two substances is dissolved in 50 parts of water, the resulting solution has an intensely bitter and persistent taste. On evaporating this solution to dryness on the water-bath, a residue is left, which, excepting a small quantity devoid of bitter taste, is soluble in alcohol of spec. grav. 0.830. The addition of ether to this alcoholic solution separates at most only a few trifling flakes upon standing. On distilling or evaporating off the alcohol and ether, a gum-like mass, soluble in alcohol and water, is left behind, and this has the before-mentioned bitter taste.

On the other hand, a solution of 1 part of salicylic acid and 2 parts of borax in water has only a feeble acid reaction, and, instead of being bitter, is very sweet at first, then momentarily salty, and lastly again sweet. On evaporating this, the residue is only partly soluble in alcohol of spec. grav. 0.830, and this seems to be only borax. Addition of ether separates here also at most slight flakes, and upon evaporation the residue has the same bitter taste as in the case mentioned before, though after a while a faint trace of sweetness may be noticed.

There is no doubt about there being a peculiar combination formed between the acid and the borax, but its nature has not been cleared up. It does not appear to take place in absence of water or moisture. Borax contains ten molecules of water of crystallization. There is, therefore, enough water here to form a considerable quantity of the compound, and it is, no doubt, owing to this fact that the mass cakes. We find it, however, to cake much less than our correspondent did. It did not cake during the first hour or so, but next morning the mass was pretty firm, though it could be reduced to powder without difficulty.

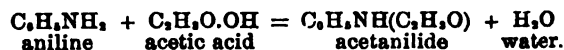
In our opinion, the prescriber had no idea of this reaction, and would probably not have ordered the prescription had he known it. We think you ought to let him know. If you cannot do this, then you would be justified in drying the borax sufficiently (it is not necessary to dehydrate it completely) to avoid the caking.

No. 2,342.—Exalgine (I. J.).

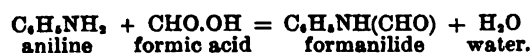
This substance, which has long been known under another name, viz., *methylacetanilide*, has been experimented with, to some extent, in one of the hospitals of this city, and has been found to produce partial or entire insensibility to pain, such as that caused by various forms of neuralgia, etc., as had been reported. It has, however, not yet been available in sufficient quantity to make extensive experiments, though by the time this number of our journal appears there will be an ample supply on the market.

Regarding the chemistry of methylacetanilide (first described by Hepp and Hofmann in 1874, *Ber. d. Deutsch. Chem. Ges.*, Vol. 10, 328, 599) the following explanation will suffice:

When an atom of hydrogen, in the benzol-ring C_6H_5 , is replaced by amidogen NH_2 , the resulting product is *aniline*: $C_6H_5NH_2$, which, for this reason, is also called *amidobenzol*. If we now imagine one of the hydrogens of the group NH_2 to be replaced by a monatomic rest of a fatty acid—that is, a fatty acid less one molecule of hydroxyl (OH)—we obtain an *anilide*. Acetic acid is $C_2H_3O_2$, or $-C_2H_2O.OH$. When the group C_2H_2O replaces one of the hydrogens in aniline, we obtain the *acetanilide* (known otherwise as *antifebrin*):



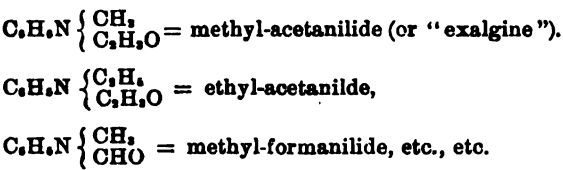
Similarly, if formic acid, CH_2O_2 , or $CHO.OH$, were to enter into combination with aniline to form an anilide, we would obtain *formanilide*:



This substance, formanilide, by the way, has recently been found to possess most remarkable properties. Injected into small animals in doses of about $\frac{1}{4}$ grain, it produced complete immobility, insensibility, and apparent death, from which the animal usually recovered after some time.

In the same manner various other anilides are formed. It may be added that the above explanation of the formation of anilides is not the one usually given. For certain reasons, which need not be given here, they are usually regarded as derived from acid amides, by the substitution

of C₆H₅ (phenyl) for one of the hydrogens of NH₂. But in the end the result would be the same.
Now, there is still one atom of hydrogen left in the series of anilides mentioned above. But this may also be replaced by a monatomic radical, such as CH₃ (methyl), C₂H₅ (ethyl), etc., and thus we obtain compound anilides; for instance:



Now, *exalgine* is the first mentioned among the above three compounds. It is prepared by acting upon sodium-acetanilide with iodide of methyl. It appears in needles or long tablet-like crystals, is sparingly soluble in water, readily in hot water, also in dilute alcohol, or in water containing a little alcohol.
It has been erroneously called "orthomethylacetanilide," as if there were also a *meta* and a *para* variety; but this is a mistake. The methyl group does not substitute one of the hydrogens of the benzol ring, but of the side ring, in which there is only one product possible, when the hydrogens are replaced by certain organic radicals.

No. 2,343.—*Root Beer* (J. C. L.).
There is no end to the recipes and formulas for so-called root beer. Our correspondent says that he has perhaps all material and appliances necessary for it at hand. If this is the case, we do not see what good we can do by offering a formula which may call for material different from that which he has. Nevertheless, at the risk of mentioning articles which he has not in stock, we will give him a formula furnished to us some time ago by one of our friends. We have not tried it ourselves, but are told that it furnishes a pleasant product:

Parsley Root, fresh.....	6 oz.
Wintergreen	4 "
Sassafras.....	4 "
Spicewood Bark.....	4 "
Wild Cherry.....	2 "
Prince's Pine.....	2 "
Hemlock Bark.....	3 "
Jamaica Ginger.....	2 "
Capsicum	1 "
Vanilla.....	1 "
Sugar, gran.....	4 "
Syrup ("golden drips").....	2 gall.
Water	q. s.
Yeast.....	4 oz.

Triturate the vanilla, finely cut, with the granulated sugar gradually added, to as fine a powder as possible. Reduce the other solid ingredients to a coarse powder by bruising or cutting, pack it in a percolator having a stop-cock, and put the saccharated vanilla on top. Then cover the contents with boiling water, and cover the percolator. When the liquid is cold, draw it off. Again pour on boiling water, allow to cool, draw it off, and continue to do this until 4 gallons of liquid are obtained. To this add the syrup, put the mixture into a keg, add the yeast, and allow it to ferment. When it has ceased to ferment, draw it off clear and bottle it.

No. 2,344.—*Laws against Abortifacients* (G. V. D.).
This correspondent asks whether there is not a law on the statute books of this State prohibiting druggists from selling certain proprietary articles supposed to be used as abortifacients, such as : Capsules of Apiol (Joret et Homolle), Pennyroyal Pills, Dr. Cheesman's Female Pills, Hooper's Female Pills, Clark's Female Pills, etc., etc.
So far as we know, there is no such law, either respecting druggists or any other persons. We presume that if any damage, accident, or death were caused by such remedies, the person who has sold the latter could be readily prosecuted. The sale of such articles, even if called for—and they are by no means as efficacious as they are supposed to be—is in our judgment reprehensible, but in a far less degree than the bare-faced, impudent, and sometimes prurient advertisements of abortion quacks in the lay newspapers. The latter do much more harm than the former.

No. 2,345.—*Ink Eraser* ("Drugs").
This inquirer wants to know if we can recommend him some compound which will "erase ink."
In reply we would say that it all depends on what kind of ink is to be erased, and from what kind of surface.
Assuming, for present purposes, that it is an iron ink, we can recommend the following mode of procedure: Moisten the spot—on paper, linen, or other surface—with a little water, and pile upon it a pinch of a powdered mixture of equal parts of oxalic and citric acids. Allow this to remain for some time. The powder should be in sufficient quantity, so as not to completely dissolve, should be distinctly wet, and cover the spot as well as a little distance beyond it. After 15 to 30 minutes the spot may be carefully cleansed with water. In the case of paper, care must be taken not to tear or otherwise injure the paper.

No. 2,346.—*Creosote and Arsenious Acid* ("Dentos").
Arsenious acid is insoluble in beechwood-tar creosote. We know of no agent which, added to the creosote, would enable the latter to hold the acid in solution. But if the creosote were dissolved in alcohol or in acetic acid, this liquid would then be able to dissolve a quantity of arsenious acid proportionate to the added solvent. Of course, the better plan would be first to dissolve the acid to saturation (or in smaller amount, as may be required) in the alcohol or acetic acid, and then to mix this with creosote short of producing a precipitate. At the best, only a small amount of arsenious acid could thus be brought into solution.

No. 2,347.—*Manufacture of C. P. Salts* (J. A. H.).
This subscriber asks us to name him some practical work on the manufacture of C. P. salts, such as are used in photography and medicine, with articles on the construction of apparatus, etc.
So far as we know, there is no one work which will completely fill the bill. As medicinal chemicals are generally of a sufficient degree of purity to answer for purposes of photography, we would suggest that our correspondent consult the following works: 1. The United States and the National Dispensatories. 2. "Remington's Practice of Pharmacy." 3. Hager, "Commentar zur Pharmacopoeia Germanica," Berlin, 1883-84 (so far as the chemicals are officinal in the Germ. Pharm.). 3. Flueckiger, "Pharmaceutische Chemie," Berlin, 1888. 4. Schmidt, Dr. E., "Ausführliches Lehrbuch d. Pharmaceut. Chemie," 2d ed. 5. Roscoe & Schorlemmer, "Treatise on Chemistry." 6. Stieren, Dr. E., "Chemische Fabrik" (with illustrations), 8vo, München, 1865, etc., etc.

No. 2,348.—*Aureoline* (D.).
Robare's Aureoline is not used in this country. It is a solution of hydrogen peroxide, of about 6 volumes, and is used for rendering hair blond.

Corrected Tables of Specific Gravity and Strength of Water of Ammonia.

THE table of Carius, which has hitherto been considered the most reliable one, regarding the specific gravity and percentage strength of water of ammonia, has recently been revised by G. Lunge and T. Wiernick upon the basis of very careful experiments (*Zeitsch. f. angew. Chem.*, 1889, 181). As this table is frequently consulted, especially certain portions of it, we reproduce it here:
The *third column* gives the figure which is to be added (+) to the spec. grav. when taken above 15° C., or to be deducted (—) from it when taken below 150° C., in order to reduce it to the normal specific gravity at 15° C.

Spec. Grav. at 15° C.	Per cent. of NH ₃	1 Liter contains at 15° C. Gm. of NH ₃	Correction of Spec. Grav. for every 1° C. + or -	Spec. Grav. at 15° C.	Per cent. of NH ₃	1 Liter contains at 15° C. Gm. of NH ₃	Correction of Spec. Grav. for every 1° C. + or -
1.000	0.00	0.0	0.00018	0.940	15.68	146.9	0.00039
0.998	0.45	4.5	0.00018	0.938	16.23	152.1	0.00040
0.996	0.91	9.1	0.00019	0.936	16.82	157.4	0.00041
0.994	1.37	13.6	0.00019	0.934	17.42	163.7	0.00041
0.992	1.84	18.3	0.00020	0.932	18.08	168.1	0.00042
0.990	2.31	22.9	0.00020	0.930	18.64	174.4	0.00042
0.988	2.80	27.7	0.00021	0.928	19.25	178.6	0.00043
0.986	3.30	32.5	0.00021	0.926	19.87	184.2	0.00044
0.984	3.80	37.4	0.00022	0.924	20.49	189.3	0.00045
0.982	4.30	42.3	0.00022	0.922	21.12	194.7	0.00046
0.980	4.80	47.0	0.00023	0.920	21.75	200.1	0.00047
0.978	5.30	51.8	0.00023	0.918	22.39	205.6	0.00048
0.976	5.80	56.6	0.00024	0.916	23.08	210.9	0.00049
0.974	6.30	61.4	0.00024	0.914	23.68	216.3	0.00050
0.972	6.80	66.1	0.00025	0.912	24.33	221.9	0.00051
0.970	7.31	70.9	0.00025	0.910	24.99	227.4	0.00052
0.968	7.82	75.7	0.00026	0.908	25.65	232.9	0.00053
0.966	8.33	80.5	0.00026	0.906	26.31	238.3	0.00054
0.964	8.84	85.2	0.00027	0.904	26.98	243.9	0.00055
0.962	9.35	89.9	0.00028	0.902	27.65	249.4	0.00056
0.960	9.91	95.1	0.00029	0.900	28.33	255.0	0.00057
0.958	10.47	100.3	0.00030	0.898	29.01	260.5	0.00058
0.956	11.03	105.4	0.00031	0.896	29.69	266.0	0.00059
0.954	11.60	110.7	0.00032	0.894	30.37	271.5	0.00060
0.952	12.17	115.9	0.00033	0.892	31.05	277.0	0.00060
0.950	12.74	121.0	0.00034	0.890	31.75	282.6	0.00061
0.948	13.31	126.3	0.00035	0.888	32.50	288.6	0.00062
0.946	13.88	131.3	0.00036	0.886	33.25	294.6	0.00063
0.944	14.46	136.5	0.00037	0.884	34.10	301.4	0.00064
0.942	15.04	141.7	0.00038	0.882	34.95	308.3	0.00065

Dr. Oskar Schliekum, well known as an authority in the various branches of knowledge relating to pharmacy, died on April 4th, the eve of his fifty-first birthday, at Winnigen (Gov. Dist. Coblenz), Germany.
"See! The Cornucuring Hero Comes!" is the heading to a show-card displayed in the window of an English "chemist."

Impurities in Saccharin.

SINCE the discovery and announcement of the sweet principle derived from benzol—viz., *saccharin*, or, to call it by its chemical name, *orthosulphaminebenzoic acid*—we have followed its development from step to step up and beyond the time when the article was turned out at a manufacturing sale, under the patent granted to the discoverer, or at least to the one who claimed to be the discoverer, namely, Fahlberg, one of the former students in Prof. Ira Remsen's laboratory at Baltimore. Up to the present we have labored under the impression that the saccharin put on the market was, practically speaking, a pure product. We have, however, been undeceived in this respect by the testimony given in the Inaugural Essay of Dr. A. R. L. Dohme, of Baltimore.*

Dr. Dohme, having occasion to require considerable quantities of the true orthosulphobenzoic acid, decided to obtain this from the commercial saccharin (anhydro-orthosulphaminebenzoic acid, or, as Dr. Dohme prefers to call it, "benzoic sulphinide"). On carefully examining this he found it far from pure, containing only between 30 and 40 per cent of the pure substance. An approximate analysis of the commercial article showed it to contain:

* "Orthosulphobenzoic Acid and Some of Its Derivatives." Dissertation presented to the Board of University Studies of the Johns Hopkins University for the degree of Doctor of Philosophy, by A. R. L. Dohme, of Baltimore. 1889. Baltimore, pp. 38.

Benzoic sulphinide (the true sweet principle) 30-40 %
 Parasulphaminebenzoic acid, 50-60 %
 Orthotoluenesulphamide, orthosulphaminebenzoic acid, acid potassium, and acid ammonium orthosulphobenzoates..... 10 %

The benzoic sulphinide, which is the real valuable constituent, is separated from the other substances by dissolving the crude saccharin in boiling water, in which it is entirely soluble. Upon cooling, the parasulphaminebenzoic acid crystallizes out in small, brilliant pearly scales melting at 280° C. The separation of the remaining substances from each other is quite difficult, as they are about equally soluble in water and alcohol. If it is desired to obtain the benzoic sulphinide, as such, the best way is either to recrystallize and mechanically separate the crystals of the latter substance, which are quite different from the accompanying crystals, or to extract with ether, in which only the benzoic sulphinide is soluble. Thus obtained, the latter crystallizes in light yellow to colorless plates or fern-shaped crystals melting at 223° to 225° C.

From this statement it follows that the purity of "saccharin" may easily be tested by treating it with ether, which dissolves the benzoic sulphinide—the real bearer of the sweet taste which the product possesses. Anything insoluble in ether is to be regarded as foreign material, diluting the real valuable principle.

BIBLIOGRAPHY.

MERCK'S INDEX of Fine Chemicals and Drugs for the Materia Medica and the Arts. Comprising a Summary of whatever Chemical Products are to-day Adjudged as being Useful in either Medicine or Technology. With average Values and Synonyms. A Guide for the Physician, Apothecary, Chemist, and Dealer. By E. Merck. 8vo, New York, 1889. Price \$1.00.

THE appearance of "Merck's Index" marks a veritable era in chemical "price-lists." We have, for some time past, been aware that a work of the kind, such as lies before us, was in course of preparation, and we were particularly aware that the greatest care would be bestowed upon the *nomenclature*, so that a completely new departure could be made in labelling chemical products for trade in English-speaking countries. That extraordinary pains have been taken to make this important feature as perfect as possible, an examination of the contents of the book will easily reveal. The English nomenclature and orthography followed for the designations of chemical compounds are, in the main, those adopted by the Chemical Society of England and by most of the modern text-books and treatises of chemistry, both in England and the U. S.

A most valuable feature of the work are the numerous synonyms by which the various products are known, and the ease with which any name can be found, since even synonyms are entered as leading words in their proper alphabetical places.

"Merck's Index," containing the names and synonyms, often with explanatory notes, of some five thousand chemical and allied products is undoubtedly a most useful book of reference for the pharmacist, the physician, the chemist and the teacher of materia medica. May the example thus set be soon imitated by our prominent wholesale drug houses, which would soon reap their reward from an undertaking of this kind.

A POSTAL DICTIONARY. Being an Alphabetical Handbook of Postal Rates, Laws, and Regulations for All who Use the Mails. Compiled from Official Sources by EDWARD ST. JOHN. New York: The Evening Post, 208 Broadway, 1889. Pp. 94. 15c.

THIS is an extremely useful manual for everybody, its contents covering nearly every subject relating to postal

rates and regulations, and having, besides an alphabetical arrangement, an index which facilitates reference.

HANDBOOK OF MATERIA MEDICA, PHARMACY, AND THERAPEUTICS, Compiled for Students Preparing for Examination. By CUTHBERT BOWEN, M.D., B.A., Editor of "Notes on Practice." Philadelphia and London: F. A. Davis, Publisher, 1888. Pp. 366, sm. 8vo.

As its title indicates, this is intended as a reminder of leading facts; but it also contains numerous formulas such as delight the heart of the average medical student, and may save him much laborious copying from blackboards.

THE PSYCHIC LIFE OF MICRO-ORGANISMS: A Study in Experimental Psychology. By ALFRED BINET. Translated from the French by THOMAS MCCORMACK. With a Preface by the Author written especially for the American Edition. Chicago: The Open Court Publishing Co., 1889. Pp. 120, 8vo. 75c.

AN argument to prove that the lowest forms of animal life manifest psychological phenomena is about as interesting and practical as the paper must have been which was read before Mr. Pickwick's society on tittlebats.

INTERNATIONAL POCKET MEDICAL FORMULARY, with an Appendix. By C. SUMNER WITHERSTONE, M.S., M.D. Philadelphia: F. A. Davis, 1888. Pp. 269, 12mo. Leather with flap. Leather-indexed. \$2.00.

THIS contains, besides a most elaborate appendix, 1,658 prescriptions classified under alphabetically arranged names of all the diseases from *Abortion* to *Yellow Fever*. It can be carried in a moderately large pocket and is a *sine qua non* for the "busy practitioner."

A GUIDE TO THERAPEUTICS AND MATERIA MEDICA. By ROBERT FARQUHARSON, M.P., M.D., etc. Fourth American from the Fourth English Edition. Enlarged so as to include all Preparations Official in the U. S. Pharmacopoeia. By FRANK WOODBURY, A.M., M.D. Philadelphia: Lea Bros. & Co., 1889. Pp. 598, 8vo.

THIS is already well known as one of the most admirable of the handbooks intended for the use of medical students. The arrangement of the text and choice of type facilitate easy reference, and, while its matter is well condensed, it does not too closely approach to the character of a mere cram-book.

NEW COMMERCIAL PLANTS AND DRUGS. No. 11. By THOMAS CHRISTY, F.L.S., etc. London: Christy & Co., 25 Lime street, E. C., 1889. Pp. 88, 8vo. 2/6. THIS issue of this ever-welcome serial contains articles relating to *Veronica nigritiana*, *Boerhaavia diffusa*, *Piche*, *Jambul*, *Ballota*, *Lycopodium tincture*, *Manaca*, *Salix nigra*, *Haya poison*, *Eucalyptus Honey*, *Sozeiodol*, *Mudar Bark*, etc.

PRICED AND ILLUSTRATED CATALOGUE of Chemical Apparatus, Assayers' Materials, and General Laboratory Supplies, made, imported, and sold, wholesale and retail, by James W. Queen & Co., of Philadelphia. Pp. 364, 8vo.

THIS is one of the most complete and beautiful publications of its kind of which we are aware. It contains illustrations and brief descriptions of many recent forms of apparatus and should be in the library of every laboratory.

COLLEGE BOTANY, including Organography, Vegetable Histology, Vegetable Physiology, and Vegetable Toxotomy, with a Brief Account of the Succession of Plants in Geologic Time, and a Glossary of Botanical Terms; being a Revised and Enlarged Edition of the "Elements of Botany," with nearly 600 Illustrations, largely from Drawings by the Author. By EDSON S. BASTIN, A.M., F.R.M.S., Professor of Botany, Materia Medica, and Microscopy in the Chicago College of Pharmacy. Chicago: G. P. Engelhard & Co., 1889. Pp. 451, 8vo.

THIS work being especially intended for pharmaceutical and medical students, it will be found that the practical exercises following each chapter are of particular value. The whole work shows great care in its preparation, the illustrations being numerous, the language simple, the type and paper excellent, the binding substantial and handsome.

We have but one suggestion to offer, and that is the provision, in future editions, of a scheme of study arranged according to seasons. If, as the author states, the study of botany is the study of plants and not the study of books, the scheme of study should be so arranged that, commencing with the early days of spring, a student may be able to study plants as they exist in nature, and not have autumn fruits, vernal germination, and summer inflorescence all jumbled together to illustrate some arbitrary system of classification.

American Druggist

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NEW YORK, AUGUST, 1889.

Whole No. 182.



DRUGSTORE ARCHITECTURE AND DECORATION.

DRUGGISTS are gradually learning the value of simplicity and compactness in the architectural arrangement and decoration of their stores. There is one new store in the city of New York which presents a beautiful effect of interior architecture based upon the fundamental idea of necessity and of adaptability of given conditions to desired ends. The building was originally a corner dwelling-house, and the previous occupant of the drugstore was a picture dealer, who, of course, required a street frontage with plenty of light. The druggist needed more space, and the basement on the side street not being available, on account of its occupancy by other places of business, he took the parlor floor of the house and connected it with the ground floor of the store by a handsome oaken stair, curving outward. From the street the effect is solid, rich, simple, and at the same time picturesque, suggesting baronial halls and ancient manors. This staircase is about six feet wide, and terminates on either side in handsomely carved newel posts, on top of which stand brass gas fixtures designed in wrought and polished spheres, and twisted rods with fluted glass shades. On the top of the staircase, a tall colored jar rises on either side. The whole arrangement of this staircase is very artistic. The wall fittings of the retail department are throughout in oak, handsomely carved in small oak leaf and acorn patterns. A decorative idea worthy of attention is found in the use of slender, fluted Ionic columns wherever they are needed to separate the compartments of the casings, and also on either side of the elaborately carved mirror frame at the right, entering from the street. In the store previously occupied by the druggist, iron Ionic columns formed part of the scheme of architectural decoration, and, in moving into a new store, he has preserved the memory of the old by basing his scheme of decoration on the Ionic columns. The wall cupboard, on the left side as one enters, is half-covered with mirrors which, in their handsome oak settings, produce an admirable effect. The many oak drawers have small oxidized silver handles wrought in tasteful designs. They are numbered instead of being labelled. The cashier's desk is a very effective piece of furniture, simple, compact, and in excellent taste. It is in

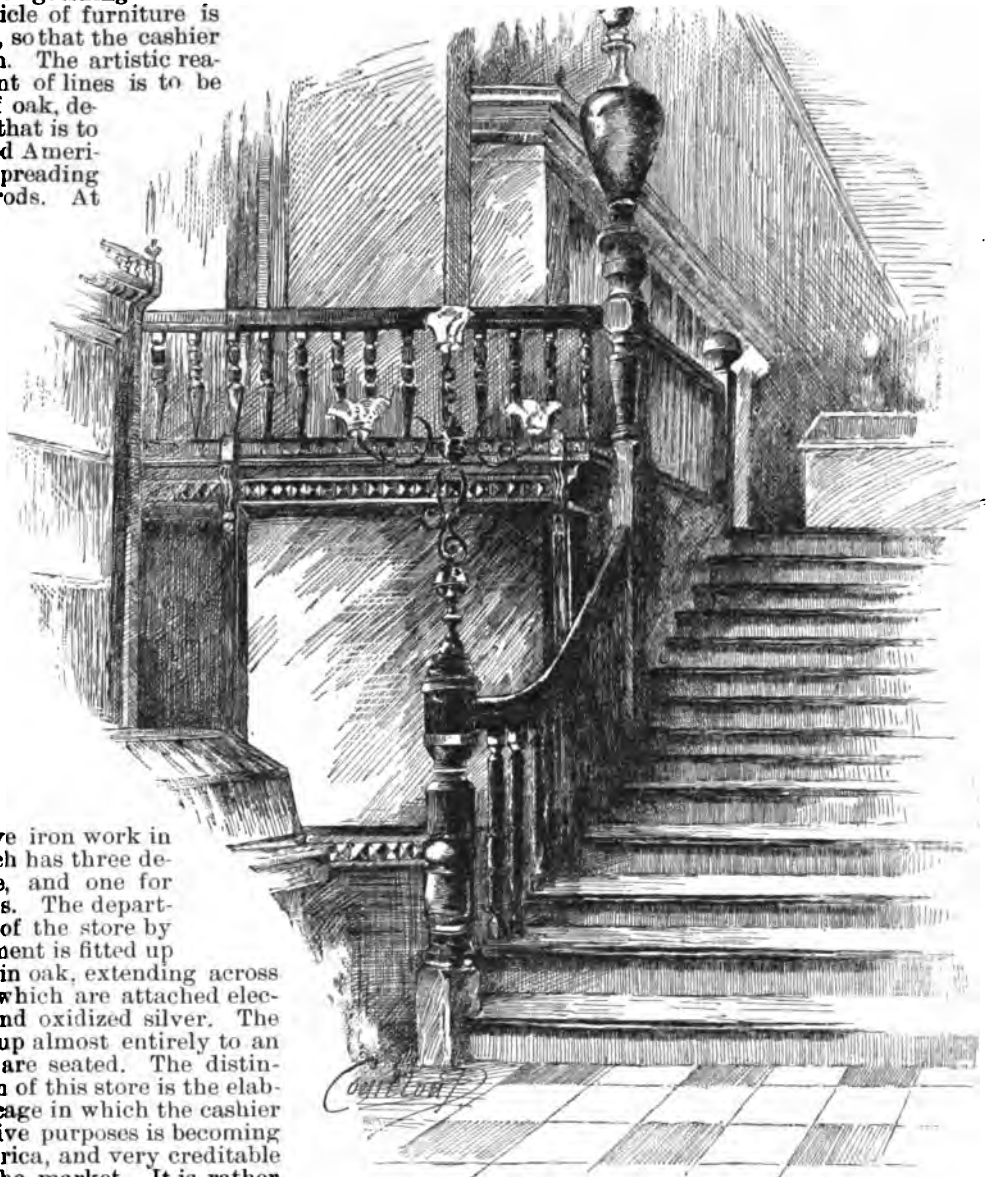
oak, with relief carvings. The distinguishing characteristic of this well-designed article of furniture is the effect of a tall, slender railing, so that the cashier sits, as it were, in a fenced-in pen. The artistic reason for this striking arrangement of lines is to be found in the chairs, which are of oak, designed in old Colonial fashion; that is to say, they are of the old-fashioned American kitchen chair order, with spreading backs composed of tall, slender rods. At the left on entering, in the angle formed by the junction of the front and side windows, stands an oaken sponge case, adorned with a judicious amount of carving, and, with the masses of yellow sponges seen through the glass sides, it presents a nice effect of color and form. The counters and the pavement are in white marble. What architectural frontage is needed at this store is of black, composite columns with Corinthian pilasters picked out in gold.

The dispensing department, on the second floor, reached by the staircase, is large and conveniently arranged, with the prescription counter extending across the head of the staircase a few feet back, and the manufacturing counter running parallel with it. The laboratory is in the cellar basement, four feet of space having been gained by raising the floor of the store.

A good use is made of decorative iron work in a large New York drugstore which has three departments—a retail, a wholesale, and one for chemicals and chemical apparatus. The departments are united at the front of the store by oaken gates. The retail department is fitted up in oak, with four showcases, also in oak, extending across the store. The gas fixtures, to which are attached electric lights, are in pale bronze and oxidized silver. The wholesale department is given up almost entirely to an enormous desk at which clerks are seated. The distinguishing feature of the decoration of this store is the elaborate and striking wrought iron cage in which the cashier sits. The use of iron for decorative purposes is becoming more and more frequent in America, and very creditable work in this material is now in the market. It is rather

too heavy in its effect for small interiors, but for large establishments and for the decoration of exteriors, and for store fronts generally, it may be used to advantage. Combined with natural woods and treated in delicate forms, it lends itself admirably to decorative purposes. The interiors of the new New York drugstores are, as a whole, very much better, artistically, than the exteriors are architecturally. The reason is, doubtless, that the fittings show the influence of the modern art movement, while the exteriors, representing a greater sum of money in the form of outlay, have not yet come under the jurisdiction of those architects who work according to progressive American methods.

(To be continued.)



Color Reactions of Certain Ethereal Oils.

Oil of peppermint, mixed with alcohol and a little powdered sugar, assumes a bluish-green color when heated with dilute hydrochloric or sulphuric acid. Menthol which is contained in this oil does not give the reaction. Phloroglucinol is a very delicate reagent for those ethereal oils which contain eugenol. Thus *oil of clove*, which consists of eugenol and a sesquiterpene, $C_{15}H_{22}$, gives a bright red color when treated with alcoholic phloroglucinol and concentrated hydrochloric acid. Resorcinol employed in the same manner causes a red-violet coloration, and pyrogallol a violet one. *Oil of cinnamon* (cassia oil) treated as above with phloroglucinol gives a deep red color, and with resorcinol a cinnabar red. *Oil of pimento* is colored pink by phloroglucinol and dirty violet by resorcinol in alcoholic solutions and with addition of hydrochloric acid. The three last-named ethereal oils, when mixed with alcoholic aniline sulphate and dilute hydrochloric acid, assume a yellow color, especially on boiling. It is probable that this reaction is due to eugenol contained in these oils.—A. IHL. Abstract from *Chem. Zeit.*, 13, 264, in *J. S. Chem. Ind.*

Note by Ed. Am. Drugg.—The chemicals mentioned in this note, ending in *ol*, are thus named by some chemical writers, in order to show that they belong to one class of bodies. Otherwise the substances are known as "phloroglucin," "resorcin," and "pyrogallie acid."

Method of Separating Arsenic from Antimony.

O. KOEHLER communicates in the *Arch. d. Pharm.* (May, 1889, 406) a method of quantitatively separating arsenic from antimony, which is based upon, but is an improvement of, one mentioned by Rose. The latter directed that both elements be precipitated as sulphides, and that the latter be treated with concentrated hydrochloric acid at a gentle heat, whereby antimony sulphide is dissolved, while sulphide of arsenic is not. It has, however, been shown that a little of the arsenical sulphide is always dissolved under those circumstances. The question now arose whether it was not possible to effect the separation in this manner that hydrosulphuric acid, when passed into a hot concentrated hydrochloric solution of the two metals, would precipitate all the sulphide of arsenic before throwing down the antimony sulphide. In other words, the author's object was to ascertain whether hydrosulphuric acid would completely precipitate arsenious acid as As_2S_3 , in presence of antimony compounds, from a hot concentrated hydrochloric solution.

It was ascertained by special experiments that for every one part of antimony trichloride (supposing this to be the antimony compound present) at least two parts of concentrated hydrochloric acid must be added. If less acid or any water is added, some antimony sulphide would subsequently be precipitated. In an experimental solution used by the author there were contained:

20 C.c. of solution of antimony trichloride...	sp. gr. 1.330
45 " " hydrochloric acid.....	1.124
5 " " a solution of 1 Gm. of arsenious acid in 1 liter of water.	

This mixture was heated to near boiling and a current of hydrosulphuric acid passed through it until the gas was in excess even after shaking the mixture. The separated arsenic sulphide was now collected on a filter moistened with hydrochloric acid (to prevent separation of

antimony sulphide), and the precipitate washed with a mixture of hydrochloric acid (one part) and water (three parts) until a drop of the wash-water, when dropped into a solution of hydrosulphuric acid, no longer caused a red tint, showing that all traces of antimony chloride had been washed out of the filter.

The filter, together with the arsenic sulphide, was now put into a beaker and treated with bromine water, so as to completely reach every part of the precipitate. After macerating some time, all the arsenic was converted into arsenic acid. The whole was now filtered, the filter and contents thoroughly washed with ammonia, and finally enough ammonia added until the liquid became colorless.

Next an excess of magnesium mixture (such as is used for precipitating phosphates, etc.) was added, and the mixture, after being stirred, set aside for 24 hours. During this time all the arsenic acid separated in form of ammonio-magnesium arsenate. This was collected upon a filter—previously washed, dried at $103^{\circ}C$, and tared—and washed with dilute ammonia until a portion of the wash-water acidulated with nitric acid ceased to give a turbidity with nitrate of silver. Finally it was dried in a hot-air bath at 102° – $104^{\circ}C$. to constant weight. In this condition the precipitate has the composition $2(NH_4MgAsO_4) \cdot H_2O$.

The analytical data quoted by the author show that the method is quite satisfactory.

Historical Note on Antimony.

As a supplement to the interesting paper by Prof. James F. Babcock in our last November number (page 202: "Historical Notes on Antimony and its Principal Combinations"), and to the notes appended to it by the editors of this journal, we desire to announce that metallic

antimony has indeed been known to the ancients, at least in Eastern countries. Recent discoveries in the trans-Caucasian and Babylonian-Assyrian regions have shown that the metal has been used, in very olden times, for the manufacture of vessels, ornaments, and other objects. An old vessel exhumed at Tello (southern Babylonia) is reported to consist entirely of antimony. Virchow believes that the supposed tin objects formerly found there are also antimony, since tin ore does not occur in the Caucasus, so far as known.

New Test for Thymol.

To a solution containing thymol, some drops of potassium hydrate solution are added, and so much iodized potassium iodide solution that the solution becomes yellow, thus containing only a little free iodine. A beautiful red color is obtained on gently warming; this gradually becomes more intense, but disappears after a time or on warming more strongly. The test detects about 1:20,000 of thymol in water. Other phenols examined did not give this coloration.—L. v. Italie in *Arch. d. Pharm.; J. Chem. Soc.*



Cashier's Desk.

A SIMPLE HOT-AIR BATH.

MR. T. O'CONOR SLOANE, Ph.D., who has suggested many ingenious devices for adapting simple articles to laboratory use in such a manner as to dispense with the need for more elaborate and expensive appliances, describes in the *Scientific American* of June 1st a very efficient hot-air bath for laboratory use, in which an ordinary flower-pot is the essential feature. An inverted flower-pot is placed on a tin pan or sand-bath, and this, in turn, is supported by a tripod or retort stand over a Bunsen burner (or kerosene stove). The usual aperture in the bottom of the pot serves for the insertion of a perforated cork through which a thermometer is passed. As the sand-bath directly over the burner becomes very hot, it is advisable to invert a second smaller pan within the first, as shown in Fig. 2, to prevent too direct a radiation of heat from the hot metal. Upon the latter the little stand or bent triangle, supporting the crucible or watch-glass containing the substance to be heated, may be placed. The bulb of the thermometer should be near the substance to be dried, to insure a correct indication of temperature. To place a vessel in the chamber or remove it, the pot must be lifted from the sand-bath. The porous nature of the pot not only provides for some ventilation, but also serves to absorb the vapors given off during the process. To adapt the pot for use with drying tubes or retorts, its walls can easily be perforated to admit of such arrangements as are shown in other figures. It conduces greatly to the maintenance of an even temperature to use the second inverted bath. A hint may also be taken from the former custom of employing a heavy drying plate. If for the light metal pans a plate $\frac{1}{4}$ inch or more in thickness be substituted, the temperature will not be subject to as rapid variations. The tray furnished with the next largest size of flower-pot may be used instead of the sand-bath, and gives an absolutely non-corrodible construction. While the bath is in use for drying substances in its interior, its top, which has a rather low heat, affords an excellent place for drying precipitates wrapped in their filtering paper. It is generally just hot enough to dry them with reasonable quickness without danger of spurting, and it also acts, by its capillarity, to absorb the water directly.

Detection of Mercury.

THE test employed is the converse of Nessler's ammonia test. If a mercuric chloride solution is treated with potassium iodide until the solution again becomes clear, then with sodium hydroxide, and finally with a few drops of ammonium chloride solution, a yellow or brown turbidity arises according to the amount of mercury present. The limit of the test for mercuric chloride is about 1:31,000, whilst the stannous chloride test has a limit of about 1:40,000 to 50,000. The former test may, however, on account of its characteristic color, very well supplement the latter. The test can be applied to blood, urine, and other organic substances after oxidizing with hydrochloric acid and potassium chlorate.—J. KLEIN, in *Arch. d. Pharm.* and *J. Chem. Soc.*

Detection of Cotton-Seed Oil in Olive Oil.

E. HIRSCHSOHN and J. BIEL recommend the following method in the *Pharm. Zeitsch. f. Russl.* (27, 723): 3 to 5 C.c. of the oil to be tested are placed in a test tube with 6 to 10 drops of a solution of 1 Gm. of crystallized gold chloride in 200 C.c. of chloroform; the tube is placed in boiling water and heated for 20 minutes; no red coloration should appear. Experiments made with the following oils showed that they were indifferent to gold chloride under the above conditions: earth-nut, hempseed, linseed, poppy-seed, almond-kernel, mustard-seed, sesame and sunflower-seed, and wine-lees. Cotton-seed oil alone was found to take a coloration, rose red at first, passing to cherry red. On the other hand, cotton-seed oil is not detected equally well when mixed with other oils; the test does not succeed at all in drying oils; it succeeds very well in earth-nut, sesame-seed, almond-kernel oils, etc., and best of all in olive oil, even 1 per cent showing a raspberry-red color in 20 minutes.

According to J. Biel (*Pharm. Zeit.*), 5 per cent of cotton-seed oil in lard can be detected with certainty by gold chloride.—*J. Chem. Soc.*

On Bitterwaters.*

BY ENNO SANDER, PH.D.

ON a cold day last winter, I observed in my laboratory a considerable deposit in a bottle containing a ten-per-cent solution of sodium sulphate, while a bottle of "Rubinat Condal" next to it had retained its limpidity, although, according to the analysis on its label, it contains 9.323 per cent sodium sulphate and so much of other salts as to increase its solid ingredients to a fraction over ten per cent. Thinking that an accidental disturbance to the sodium sulphate bottle might have caused the deposition of the crystals, I tried to produce the same effect in the Rubinat by shaking it, but could not change its appearance in the slightest degree. After the determination of its specific gravity (which amounted to but 1.038, and indicated a solution of anhydrous sodium sulphate of only 4.3 per cent), I came to the conclusion that this and other waters might need an examination, which was given, and I now offer the result of my investigation of some bitterwaters in this paper.

The name "bitterwater" has been adopted from the German, and is given to those strongly purgative waters which are impregnated with a large quantity of solid ingredients, composed, more especially, of alkaline and earthy sulphates. The latter are accompanied occasionally by alkaline chlorides, but seldom by carbonic salts and free carbon dioxide. The presence of hydrogen sulphide is generally caused by a reduction of their sulphuric salts in contact with organic matter, which latter is either an

original part of the composition of the water, or an accidental addition to the contents of the bottle caused by careless cleaning. The coexistence of calcium and magnesium sulphate in these waters led Mitscherlich to attribute their presence to a double decomposition of calcium sulphate and magnesium carbonate, while others explain it by the action of decomposing pyrites upon talcose slates or other silicates containing magnesium. Thus have been formed in various places layers of salty crystalline masses, and not long ago I received from the northern part of Arkansas an amorphous mass of salty appearance and bitter taste, which, after being dissolved in hot water and filtered, yielded from the first crystallization a considerable quantity of pure magnesium sulphate. It was accompanied by gypsum, iron, and silica, and no doubt strong bitterwater could have been obtained there if it had been dug for.

Bitterwaters also frequently occur in beds of marl which have been formed by the decomposition of rocks containing the elements necessary for

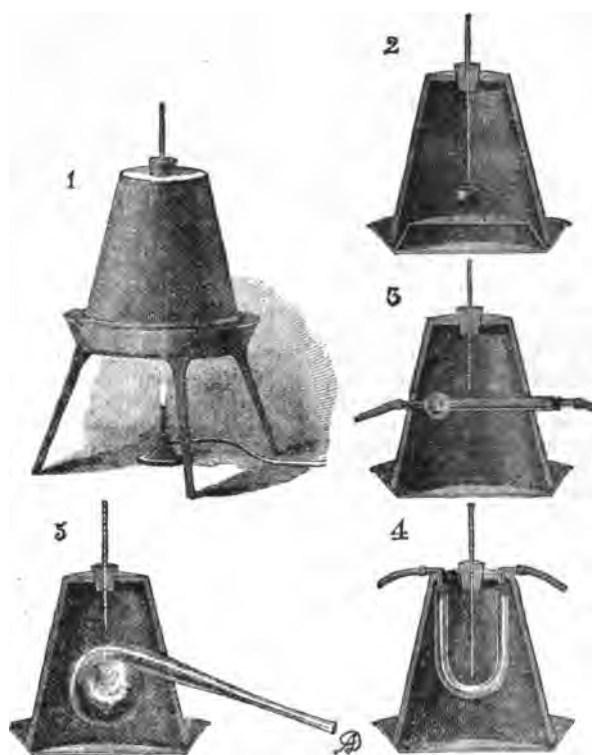
the production of these waters, through the agency of atmospheric precipitations, which, penetrating into the soil, absorb its soluble substances. Such waters are consequently dependent upon atmospheric influences, and demonstrate it by the inconstancy of both their ingredients and their temperature. To this special class belong those waters procured from wells sunk into the ground, as, for instance, those near Buda-Pesth and in the northern part of Bohemia.

Bitterwaters are limpid and devoid of color, the latter rarely reaching a pale amber. Their salty, bitter taste sticks to the tongue, and makes them very disagreeable and nauseous to the taste—qualities intensified by the absence of carbon dioxide.

There are many bitter springs and wells mentioned in the "Mineral Springs of the United States" (Bulletin of the U. S. Geological Survey, by A. C. Peale, M.D.), but the composition, especially of those containing a minimum of from 50 to 100 grains of sulphate salts, is known of but a comparatively small number. They are distributed all over the country, but the fame of few has reached beyond their own neighborhoods, and, as far as my knowledge goes, none are used commercially like those European purgative waters so highly recommended by our secular and professional press.

The "Rubinat Condal," a Spanish purgative water, referred to in the outset of this paper, claims 100.56 parts of solid ingredients in 1,000 parts of water, almost all of which are sulphates, and with this array of figures proclaims that "this water is superior to any other water of the same kind in Spain or Europe."

* Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.



Sloane's Hot-Air Bath.

It has long been the universal custom among chemists to calculate in their anhydrous state the solid ingredients or saline contents of any substance of which an analysis is made, and, when for any reason this rule is violated and the crystalline form of a salt is reported, to mention the exact combination of the salt and water which go to make up the crystals so reported—a proceeding rendered necessary by the fact that some salts combine with varying equivalents of water, according to their different forms of crystallization. It must, therefore, be surmised that Dr. Canudas, of Salada, knew of this established custom when he rendered his report of the analysis of Rubinat Condal, and that every physician, pharmacist, and chemist—in short, everybody who is acquainted with the rules of chemical analysis—has presumed that the sodium sulphate and magnesium sulphate, both ingredients of the Rubinat Condal, were calculated in the analysis as anhydrous salts.

As mentioned before, the specific gravity of Rubinat Condal is 1.038, but, as its analysis claims over ten per cent of solid contents (of which 9.64 consists of magnesium and sodium sulphates), its specific gravity ought to approximate that of a ten-per-cent solution of anhydrous sodium sulphate, or 1.092 (Storer's "Dictionary of Solubilities," p. 627). A specific gravity of 1.038 corresponds to a solution containing 4.3 per cent of sodium sulphate, and to 9.75 per cent of Glauber's salt (*ibid.*), and the evaporation of 100 cubic centimeters of Rubinat, which were taken from a bottle at a temperature of 60° F., yielded a residue of 4.531 Gm. of solid ingredients, which corresponds almost precisely with the formula of the analysis, provided the water of crystallization be deducted from the figures expressing the quantities of the sulphate of sodium, magnesium, and calcium. The determination of the sulphuric acid confirmed this statement. Whether this water comes from a spring or a well, or is simply a filtered and bottled solution of a crude Glauber's salt, I have not been able to ascertain.

The "Natural Bitterwater of Friedrichshall" is obtained from a spring in Germany which was known and used for manufacturing common salt as early as the twelfth century, and for Epsom and Glauber's salts since the last century. It occurs in a bed of marl formed with sandstone, gypsum, and dolomite belonging to the Keuper system. In former years, a bitterwater was bottled at the spring which was produced by mixing the water from the old, weaker spring with that of a new and stronger artesian well, in such proportion as to give it a specific gravity of 1.022, and it was introduced by Dr. Bartenstein in 1842. The analysis of Justus von Liebig, in 1847, by whom it was strongly recommended, increased its popularity, although it had to share it with the Kissingen Bitterwater, the production of which in almost identical proportions was also recommended by Liebig. They both contain 25.294 parts of solid ingredients in 1,000 parts of water (Dr. O. Dirufsen, in *Balneo therapie*, 1876, pp. 144-146).

A stronger water than this must have been bottled previous to 1885, for the analysis of a sample taken from J. F. Heyl & Co. in Berlin at that time showed 35.938 parts, while the water claimed to be taken from the artesian well personally by Prof. Dr. Oscar Liebreich in 1885 is the strongest and contains 61.396 parts of solids in 1,000 parts of water (*Zeitschrift für Mineralwasser-Fabrikation*, January, 1886, p. 249). Since that time this strength has been kept up. I have obtained a similar sum total from my evaporations with a specific gravity of 1.042.

The marl beds of northern Bohemia consist of decomposed basalt and limestone, gypsum, and carbonate of lime. Near the villages of Pullna, Saidschutz, and Seidlitz, some forty or fifty wells have been sunk into the marl. They have a depth of about ten feet, and serve as receptacles for the atmospheric water which filters through the strata and in so doing take up the whole soluble constituents. For this reason there is a variation in the results of analyses of these waters which have been made at different times. Pullna contains 32.72, Saidschutz but 23.21, and Seidlitz only 16.4 parts of solids in 1,000 parts of water. The latter spring is noteworthy from having given its name to the well-known and popular seidlitz powders, although they do not contain any of its ingredients. The use of these waters has become limited, and their importation has almost entirely ceased.

Where the bitterwaters of Buda-Pesth, the various Hunyadi, Stephans, Victorias, Rakoczys, and some thirty more, are competing now in a hot struggle for ultimate superiority, there was but a large pond forty years ago, on the banks of which crystals of sodium sulphate were frequently found. The plateau on which this pond existed was drained within the next ten years and the Kelenfold cultivated with great success. Wells then became a necessity, and on digging the first, in 1863, a water of salty and bitter taste was obtained, which on trial promptly manifested its superior medicinal properties. More wells were soon in order, and all that have been dug have produced waters of similar medicinal value. Although the strength and quantity of these waters depend upon conditions similar to those explained above, it seems that they are not subject to irregularities in the amount of their solid ingredients as are other waters of the same class—a fact perhaps principally due

to the imperviousness of the underlying strata. These wells have a depth of from fifteen to twenty feet, and yield more or less water according to the season. That their constancy, especially that of the Hunyadi Janos, was maintained for a long time, was shown by the similarity of four analyses, made by as many different chemists, during the period from 1863 to 1870. Their temperature, however, was not so uniform, and, according to the season, ranged from 45° F. in March to 56° F. in September (Valentiner, *Balneo therapie*, 1876, p. 148).

This constancy of the solids has not been so well maintained during later years. While Liebig's analysis in 1870 gave the sum total of solid ingredients as 35.055, R. W. Bunsen found an increase of about 10 per cent in 1876, or 38.626 parts in 1,000. Whether this increase was due to natural causes or to certain manipulations of the proprietor, Mr. A. Saxlehner, may be a difficult question to decide, but it cannot be denied that he was accused in 1877 by some former employees of having tampered with the different wells, mixed their outputs, and attached to the bottles, which had been filled indiscriminately from this mixture, the label bearing the analysis of J. v. Liebig for well No. 3. There are strict laws in Austria against such proceedings, which are rigidly enforced. Information in the form of affidavits to the foregoing effect reached the authorities, and the analysis of J. v. Liebig, which used to grace the bottles with its bright scarlet letters, has since disappeared from the labels of Andreas Saxlehner's Hunyadi Janos mineral water. Meanwhile its solid contents seem to be still increasing; at least the last bottle that I examined contained water with 42.59 parts of solids in 1,000, and had a specific gravity of 1.033.

The use of bitterwaters by persons who lead a sedentary life, and do not care to give up the pleasures of the table, has become almost universal; but the taste of these waters is abominable and nauseating. However, Prof. Dr. R. Fresenius, the eminent chemist, in his opinion on Hunyadi Janos, has given a valuable hint in this direction. He says: "Although its contents, of free and half-combined carbon dioxide, as in all bitterwaters, are not large in themselves, they are not insignificant, and no doubt have a beneficial influence upon its taste."

Every one who has ever taken Hunyadi Janos knows that its taste is still far from pleasant, but the thought suggests itself that, if a small amount of carbon dioxide be of such benefit, how much more influential in this respect would a thorough carbonization be? There are very few pharmacists who have not had some disagreeable experience in the handling of imported bitterwaters on account of deposits and rank odor—a fact which had induced some sagacious dealers to ask permission to draw the cork before delivering the bottle. All such inconveniences could be easily avoided by the recommendation and sale of carbonated artificial bitterwaters, which, by their correctness, freshness, and comparatively fair taste, would quickly supersede the nauseating imported stuff.

And it should be borne in mind that carbon dioxide is acknowledged to be an active tonic for digestive organs, and that bitterwaters impregnated with it will tonify and strengthen the intestines, while without its aid their prolonged use will weaken and prostrate them.

Thiocamf, or Sulphurized Camphor.

DR. EMERSON REYNOLDS has published an extremely laudatory notice of a new disinfectant named "thiocamf," the basis of which is said to be a liquid that is formed when sulphur dioxide is brought into contact with camphor (*Chem. News*, June 22d, p. 291). It appears that although sulphurous acid gas alone requires a pressure of at least two atmospheres for its liquefaction, contact with camphor effects the liquefaction at once without any pressure. Some little mystery is preserved about other bactericides that are introduced, but, as the preparation is to become the subject of a patent, this is perhaps explicable. The principal feature, however, seems to be that whereas the liquid can be kept in bottles without pressure at an average temperature, the mere exposure of it in a thin layer to the air determines the steady evolution of relatively enormous volumes of sulphurous acid gas.—*Pharm. Journ.*

The Conversion of Oleic into Stearic Acid.

By heating oleic acid with 1 per cent of iodine in sealed tubes to 270°-280°, a mixture of fatty bodies results, containing 70 per cent of stearic acid. This fatty acid can be separated by melting the contents of the tubes with tallow soap, boiling with acidulated water, and then distilling with superheated steam. One-third of the iodine is obtained as hydriodic acid in the resulting liquids, but the remainder is difficult to recover, being retained in the tarry residue formed. Bromine acts similarly, yielding a solid acid melting at 51.5°, whilst with chlorine an acid melting at 31.5° results. The addition of colophony facilitates the reaction in each case. It is suggested that the unsaturated oleic acid first takes up iodine, that then hydriodic acid is given off, and this acts upon the oleic acid with the formation of stearic acid and regeneration of iodine.—P. DE WILDE and A. REYCHLER in *Bull. Soc. Chem. (J. Soc. Chem. Ind.)*.

IMPROVEMENT IN HOT-AIR BATHS.

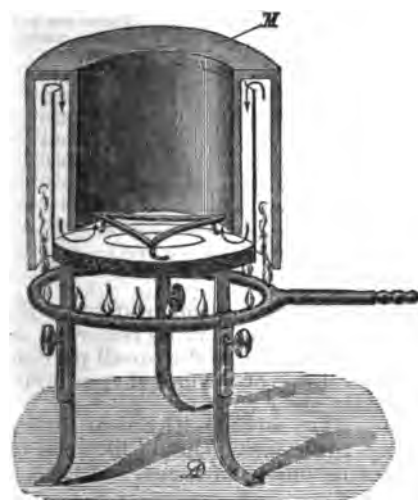
PROF. LOTHER MEYER has made some improvements in the hot-air baths which he recommended some six years ago (see our abstract in NEW REM., 1883, 235). He now prefers to make the outer mantle (see cut), M, of clay instead of copper. The frame which carries the mantle is of iron. The bottom is a double one, and there is an opening in it which may be closed by a cover. The heating is done by means of a coil of pipe, having the burners arranged in a circle. If the bath is to be used for heating retorts, flasks, etc., the latter are simply placed on a triangle inside. Since the vessels do not come in contact with the flame, and are heated throughout very uniformly, there is but little danger of charring the contents or of breaking the vessels.

If the bath is to serve as a drying chamber, a separate vessel, T, of copper or porcelain (see Fig. 2), is placed inside. The substance to be dried is placed in this and the double-walled cover D on top of it. The latter has two tubulures, one for the thermometer, and the other for allowing the escape of gases, etc.

By modifying the form of the cover, flasks may be placed within the chamber so that the neck of the flask may still project beyond the cover.

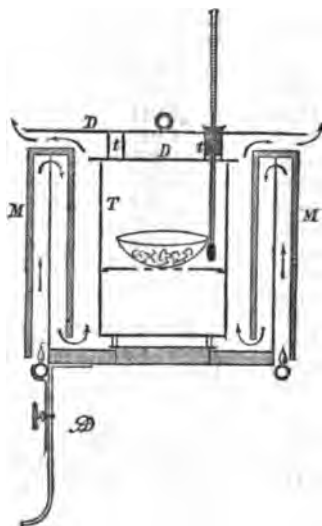
All forms of hot-air baths, constructed after the plan of those here described, must be so constructed that the channels through which the hot air passes are of the proper proportion, in comparison with the amount of heat produced by the burner. For instance, if the gas burns from small orifices of 2 or 3 millimeters in diameter, then the walls of the channels should not be more than 10 millimeters distant from each other, because otherwise there will be too great a loss of heat.—After *Berichte*, 1889, 879.

FIG. 1.



Lother Meyer's Hot-Air Bath.

FIG. 2.



Kerosene Burner.

AN IMPROVED KEROSENE BURNER.

THE kerosene burner here illustrated has many advantages over those heretofore put on the market.

In the first place, the reservoir is separate from the burner or stove, and is hermetically closed, which prevents both leakage and accidents from ignition of the liquid. The vapor of the burning kerosene becomes mixed with a proper proportion of air, whereby the flame is rendered blue (non-luminous) and acquires the highest obtainable heat. As will be seen from the cut, the burner is placed horizontally, and is fed from below, the supply being regulated by an adjustment screw. Before using the apparatus, pressure is generated in the reservoir by means of the bulb attached by a tube to the inlet at the top.

The form shown in the cut represents only one of the methods of applying the principle. Other constructions are provided for heating boilers, stoves, etc. The chief depot is at Munich (A. v. Wursterberger & Co., 16 Schwanthalerstrasse).

Marking-ink Pencils.

In one of the patents applied for by Mr. J. Hickisson, it is stated that Congo red and benzo-purpurine are used in the manufacture of marking material. The coloring matter is made up into a plastic mass by admixture with suitable binders, such as albumen, borax, kaolin, and gum tragacanth. The mixture is moulded into sticks, which are imbedded in wood or fitted in a holder. The mordants used may be in solution or made up into tablets to be rubbed on the material. A mixture of two or more of the following compounds may be employed as the mordant: pyrogallie acid; sodium aluminate, arsenate, carbonate, chloride, etc.; sulphates of iron and copper; alum; borax; tannic acid, etc.—*Chem. and Drugg.*

A Pointer in Dispensing.*

BY S. F. HUGHES, PH.G., SAN FRANCISCO.

EVERY druggist appreciates the sense of embarrassment with which prescriptions applicable to delicate diseases are called for by the customer.

The ruby blush of the cheek too often tells the secret before the timid lips can speak it; the gaudy and fashionable attire may allure or amaze the layman, but the little scrap of paper handed to the clerk by the customer strips the latter of his spirit of nonchalant audacity and transforms him into a contrite creature, presenting his prescription, for which he richly pays, with an air of penitence intensified by an uncontrolled embarrassment of manner.

The writer was moved to these reflections a short time ago by a young man handing him a prescription as follows:

R Ung. Hydrargyri, ʒi.

Div. in chart. No. xx.

Sig. Use as directed.

DR. — — —

I determined to get out of the old way of preparing this prescription, and am happy to state that I was able to dispense it in one-third of the time heretofore required in the old process, by the adoption of the following method, which I can earnestly recommend to the use of the profession, it being very simple but quite practical.

I first lay the Ung. Hyd. on a pill-tille and roll it into a long roll, adding plenty of lycopodium to keep it from sticking to the fingers, and cut it into twenty parts, using a heated spatula to avoid adhering.

Each piece is then rolled into a marble shape by placing it in the palm of the hand and, as stated above, using

lycopodium *ad libitum*; the waxed paper being laid out on the counter, each piece when finished was dropped on the paper without adhering in the least. I then folded each and dispensed as usual.

It may be said that lycopodium does not affect the absorption of the mercury in the least.

Fruit Syrups.

ONE of the recent numbers of Volume II. of the "Handbuch der praktischen Pharmacie," by Beckurts and Hirsch, from which important work we have several times given extracts, contains a very practical and instructive chapter on the preparation of fruit syrups, of which we give a translation in the following:

All fruit to be used for fruit syrup must be ripe, of good quality, freshly gathered, and worked up while fresh. If the fruit has been kept some time after being gathered, particularly when in large heaps [and of a soft or delicate structure], and at a warm temperature such as is likely to prevail at the time of ripening, it will often be found that fungi develop in the interior of the heap, and more frequently still that a fermentation sets in which is liable soon to pass into the acetous stage, thus rendering the juice unfit, at least for medicinal use. For this reason it is advisable to reduce the fruit at once to a pulp, care being taken, in the case of currants, that the seeds are separated as soon as possible from the pulp, and, in the case of cherries, that not only the pits are crushed, but also the seed-kernels contained therein properly comminuted. This is most conveniently done by passing them through the rollers of a mill. But where this is impracticable, the cherries may be put whole into a sack made of wide-meshed material, and subjected to a gradual and

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

strong pressure. The residuary cake is then pounded in a mortar. The crushed mass, together with the expressed juice, is now transferred to a rather high and narrow vessel, so as to fill it to about two-thirds of its height, the vessel closed with a cover fitting snugly over the edge, and set aside in a place free from dust or vapors, at a temperature not exceeding 59° to 68° F. When large quantities are operated upon, it is best to use vessels provided with a faucet near the bottom, so as to permit the drawing off of most of the juice, after completed fermentation, without having to dip out the whole mass and put it under the press. The inner orifice of the faucet, to prevent its being stopped up, is covered with a coarse piece of woven material, straw, or other convenient substance.

According to the degree of ripeness of the fruit and the temperature, the fermentation of the juice may begin in a few hours or after 1, 2, or 3 days. In any case, the mass should be well stirred at intervals of 2 hours, the particles of fruit which float on top being pressed down into the juice which is at the bottom. If the stirring is neglected, the more exposed layers may easily develop fungi or run into acetous fermentation.

Even subsequently, when the access of air is retarded by carbonic acid gas forming a layer over the contents of the vessel, stirring must not be neglected. As fermentation proceeds, the dregs separate more and more from the liquid. The latter becomes more thin-fluid, the dregs assume a paler color, the mass previously swelled up by carbonic acid gas collapses more and more, and the development of gas becomes more feeble. This is the moment—particularly if the alcohol test mentioned below (near end) shows the process to be approximately completed—when the liquid must be separated from the solids. For this purpose, the liquid is allowed to drain off as much as possible, the dregs transferred to a sack of not too loose texture and subjected to a gradually increased pressure which should be finally maintained for some time. It is surprising how much juice will drain out if pressure is applied gradually and at intervals.

The fermented juice is at once transferred to bottles, carboys, or casks, which must be completely filled, loosely stoppered, and stored in a cool place (the cellar or other convenient locality). It will there undergo a secondary fermentation whereby it becomes partially clarified and more ready to pass through the filter. When freshly separated from the dregs, the juice still contains a large amount of fine particles in suspension, which would rapidly clog the filtering surface, for which reason it should be allowed to stand at rest a few days to settle. This is particularly the case with currants, strawberries, raspberries, and barberries, while the juice of buckthorn-berries, mulberries, and cherries becomes clear and filters more rapidly. Nevertheless, if the juice is to be clarified by settling alone (without filtration), several months are necessary. As long as the juice, in consequence of the secondary fermentation, contains an abundant quantity of carbonic acid in solution, it does not undergo any material change, nor does it lose color. But after the escape of the carbonic acid, even a perfectly clear (settled or filtered) juice becomes turbid within a few hours, loses part of its color, or even changes color. For this reason, the juice should be filtered when it has become moderately clear by standing, but while it still contains carbonic acid gas. The latter also preserves it, during filtration, against the injurious effects of atmospheric air.

In practice, the following method has been found particularly useful: Separate the *thin juice*, without disturbing it, by means of a siphon or faucet—but not by inclining the vessel and pouring it off—from the sediment. Stir or mix the latter by itself with the remainder of the liquid, and pour it at once upon a moistened paper filter provided with double points [that is, resting within a smaller filter, so as to render the point stronger], and fill the filter to about $\frac{1}{2}$ or $\frac{3}{4}$ of its height; then gradually pour on top the *thin juice*, and keep the filters as uniformly full as possible by frequent refilling. In this manner the filtrate will pass through clear from the very beginning, the filters do not become clogged so readily and remain in action usually during fully 24 hours, so as to yield, during this time, a quantity of filtrate corresponding to between 4 and 8 times their capacity, according to the nature of the juice. Besides, they will break only in rare cases. It is, of course, advisable to pour the clear filtrates together in intervals of a few hours [or less], so that, if a filter should break, not too large a quantity of clear filtrate would be rendered turbid again. It is not advantageous, as a rule, to keep the same filters in operation for more than 24 to 30 hours. It is preferable to squeeze them out on the second day and to replace them by new ones. Since the liquid gradually loses its carbonic acid gas while passing through the filter, and the air soon begins to affect it, it will not do to wait until all the liquid has passed the filter, but at certain intervals the clear filtrate collected up to that moment is mixed with the proper proportion of sugar [for every 35 parts of clear filtrate, 65 parts of sugar], and the whole raised to a boil. The proper way is to cause the sugar to dissolve at a moderate heat, assiduously stirring, then to remove the stirrer, and to heat quickly to boiling without further stirring. Usually there will thus be formed a comparatively high layer of foam, which, if the fire is properly regulated, col-

lapses within 5 to 15 minutes to a small volume. During this time it materially aids in preventing too great a loss of liquid from the gently boiling syrup. If the heat is applied carelessly, the contents of the boiler easily boil over owing to the alcohol and gas contained therein. For this reason, it is advisable, in the case of large boilers, particularly those which are set in brickwork and cannot be lifted from the fire, to suspend a thermometer in the liquid, and to moderate the heat, or remove it altogether, when the temperature has risen to about 197° to 203° F., as the real boiling begins usually at 209°–210° F. [a little below the boiling point of water], and the hot brickwork usually radiates sufficient heat to bring the contents to a boil without fire. As soon as the liquid, after removal of the heat, has come to a rest, the scum is dipped off or pushed to one side, and the syrup passed through a moistened woollen filter, not too densely woven and not "felted." Utensils of tin or iron are to be avoided. Fruit juices are usually boiled in burnished copper kettles.

The yield of finished fruit syrup depends upon the degree of ripeness of the fruit, the proportion of sugar and water naturally existing in the latter, and the kind and quality of the fruits; 100 parts of stemless sour cherries yield about 150 to 200 parts of finished syrup. The yield, of course, depends greatly upon the proportion of sugar which is prescribed in the different pharmacopœias in which fruit syrups are official. Thus, for every 10 parts of clear juice, there are directed the following number of parts of sugar by the respective pharmacopœias:

15 (Greek).	18 (Russian and Swedish).
16 (Danish).	18.57 (German).
17.5 (Swiss).	

The French Pharmacopœia calculates the sugar upon the basis of the specific gravity of the filtered, more or less fermented juice. The proportions are as follows:

For every 1,000 parts of juice, of a spec. grav. (at 60° F.)	There are to be used... parts of sugar.
1.007.....	1746
1.014.....	1693
1.022.....	1638
1.029.....	1584
1.038.....	1530
1.044.....	1476
1.052.....	1443
1.060.....	1388
1.067.....	1314
1.075.....	1260

The proper moment when the first fermentation of the juice, mixed with the crushed fruit, may be regarded as terminated is ascertained by filtering off a small portion, and mixing it with half its volume of alcohol of spec. grav. 0.832, when it should remain clear.

The finished fruit syrup, when mixed with one or several volumes of alcohol of spec. grav. 0.832, should likewise remain clear and should not become gelatinous.

Oidtmann's Purgative.

DR. SAMUEL BENTON speaks highly of the use of Oidtmann's purgative as a remedy for habitual constipation, and states that the preparation contains:

Glycerin.....	3 i.
Lime Juice	3 ss.
Buckthorn Juice.....	3 ss.

with a diminutive quantity of alcohol and acetic acid (1 in 800). He has given the medicine an extensive trial, and has found it by micro-injection a most gentle and unirritating means of emptying the rectum.—*Chemist and Druggist*.

Florida Flower Farms.

A CORRESPONDENT at Fort Meade, Florida, U. S. A., writes: Raising flowers for the manufacture of perfumery is an industry that is just getting a foothold in the South, and now it is claimed that attar of rose can be made in Florida with as much success as in the gardens of Bulgaria. The two varieties of roses grown are the musk and damask. On the southern slopes of the Blue Ridge Mountains, and in parts of Florida, these varieties flourish abundantly, and it is claimed that eighteen acres, well managed, will yield \$40,000 per annum. The other flowers that are used for distillation, such as the jasmine, violets, lilies, and jonquils, are hardy here, and yield rich harvests of flowers to a generous cultivation. The only question of making the perfumer's art a leading industry in Florida is that of capital, and this seems to be furnished in the near future. A representative of a large Northern house has been prospecting around and experimenting with the flowers. He expressed himself as being well pleased with the success of his work, and a factory for the distillation of the flowers will shortly be erected somewhere in the South as a result of his visit.—*Chem. and Drugg.*

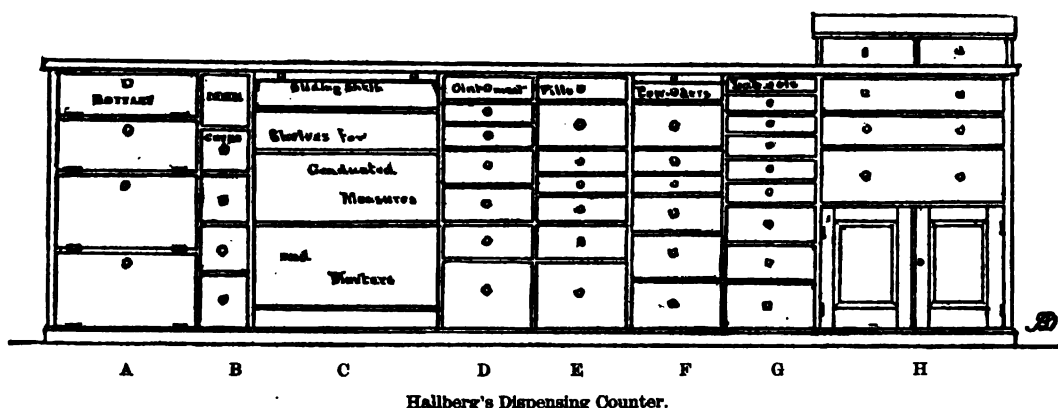
DISPENSING COUNTERS.

MR. C. S. HALLBERG, writing in the *Western Druggist*, says: "The prescription counter, or 'case,' as it is sometimes incorrectly termed, should be the most important piece of furniture in the pharmacy. As a fact, however, it is the most neglected; that is, the particular portion of it devoted to dispensing, the table proper. Many a pharmacy has a soda-water apparatus worth thousands of dollars, in which the prescription counter is scarcely fit to compound condition powders." He proceeds to give a design for a working table adapted to an ordinary dispensing business, upon which we have based the adjoining illustration. Owing to the omission of necessary measurements, our drawing differs from the original somewhat, but the one here shown is on the scale of 2 feet to 1 inch.

The design is for a 10-foot counter, 2 feet wide, recessed at the bottom, divided into five sections of 2 feet each.

first procures the vial, if a liquid mixture, from the bottle division, and then a graduate and mortar from the utensil division, and, after having finished the mixture, the capping and labelling is done at the other end, making room for another operator to follow him closely. With two scales on the counter two dispensers can work without interference.

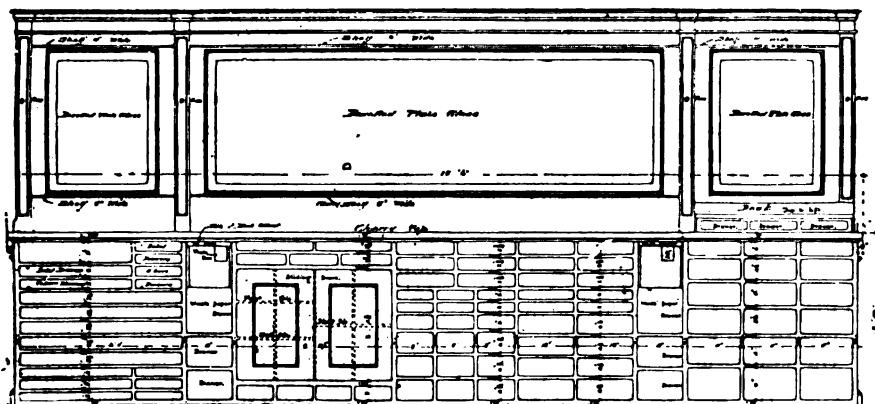
Four years ago we published, in connection with other pictures illustrating the beautiful store of Kelley & Durkee, of Boston, a design for a dispensing counter which had received a great deal of study, and was based upon many years of observation. We, therefore, reproduce it in this connection, feeling that its merits warrant special consideration. This counter is 3 feet wide and 15 feet long. It has a desk at each end, and next to each desk is a scale, one for fine and the other for coarse weighing. A long row of mortars, out of the way but in easy reach,



Hallberg's Dispensing Counter.

A. Bottles.—Four compartments consisting of lockers provided with hinged and spring doors similar to those on show cases. Each compartment is 18 inches wide and of heights to hold the following prescription vials, standing upright and corked, viz., $\frac{1}{2}$ and 1 oz., 2 and 3 oz., 4, 6 and 8 oz. respectively. These lockers possess every advantage over drawers or ordinary closets; the vials are easily reached when wanted, and are not subject to jar or breakage. **B. Corks.**—Four cork drawers, 6 inches wide, of different heights, divided in the centre. The top space is empty for two towels. **C. Utensils.**—Two feet wide, consisting of three shelves with circular indentations to hold graduated measures by the foot (upside down). The first, below the counter, for minim and 1 oz. glasses, the next

extend from scale to scale. Over the mortars, and even with the lower edge of the large glass front, is a shelf for about fifty graduates; both mortars and graduates are placed upside down to avoid dust. Under the shelf a polished brass pipe, provided with five nipples and stopcocks, furnishes gas for Bunsen burners. Steam is introduced at one end of the counter and may be used when more desirable than gas. The space under the counter has been carefully divided into drawers and closets for empty bottles, pots, boxes, utensils, etc., etc., so as to bring the things in greatest demand in convenient reach. The arrangements for pasting are different from usual and warrant a word of notice. Tinned-copper paste holders are set in butternut boards which slide into the counters above



Dispensing Counter of Kelley & Durkee, Boston.

for 2 and 4 oz., the third for 6 and 8 oz., the fourth shelf for mortars, and the floor space for larger measures. Immediately under the top is a sliding shelf. **D. Ointments.**—Consisting of drawers, 12 inches wide, arranged for ointment slab, wax-paper, tinfoil, etc., and the lower drawers, in various depths, for ointment jars, boxes, etc., of different sizes. **E. Pills.**—Drawers 12 inches wide, the upper one for spatulas, next a deeper one for one or two pill machines and smaller; the remaining drawers for pill boxes (which should be stored on end to protect the labels). **F. Powders.**—Sliding shelf on top with a shallow drawer for capping-paper, etc., and a deep drawer with compartments for powder papers and gelatin capsules. The remaining drawers for powder boxes. **G. Labels.**—One top drawer for miscellaneous, and four with compartments for prescription labels. The remainder for homœopathic vials and miscellaneous articles, such as suppository and tablet machines. **H. Writing Division.**—Three drawers for stock labels, account boxes, etc., with a closet for storing prescription books. On this section is the desk, with two drawers for the day book, poison and liquor register, prescription blanks, etc.

The advantages of this arrangement are said by Mr. Hallberg to be that, proceeding to dispensing, the worker

the waste-paper drawers. The labels are placed directly on the boards, and the paste applied becomes so absorbent, after being washed and scraped several times a week, that a dry space on which to place a label may easily be found even when business is brisk. The paste brush is laid in a little trough cut in the board.

Assay of Coca Leaves.—Mr. V. D. Marck, as the result of numerous experiments (in *Ned. Tijdschr. v. Pharm.*), gives the following as a reliable process: Mix 50 Gm. of the powdered leaves with 20 Gm. of calcined magnesia, make into a paste with water, and dry at a temperature not exceeding 60° C. Then percolate with ether, and evaporate the percolate to dryness. Treat the residue with about 30 Gm. of two-per-cent hydrochloric acid, filter, and remove residual coloring matter by shaking with ether: then make the solution slightly alkaline with ammonia, and shake three times with 25 C.c. of ether; collect and dry carefully, finishing in the exsiccator. Ether is better than chloroform for extraction, as the latter requires a greater degree of heat for evaporation, and this is injurious to the cocaine.—*After Chem. and Drugg.*

What is the Effect of Heat and Moisture as a Preparatory Step in the Extraction of Some Drugs?*

BY J. U. LLOYD.

IN considering the natural condition of vegetable organisms, we find that recent plants present in one respect a marked variation from the same substances after drying. The inherent moisture amounts invariably to a large part of their bulk, and the greater proportion of this water is lost by drying. (Note 1.)

Aside, however, from the decomposition products and dissociations produced by desiccation, there is involved a feature that should perhaps not be overlooked, one that I believe to be of considerable importance in some instances.

The succulent vegetable structure, in its natural condition, is readily permeated by an appropriate alcoholic menstruum; the cell tissues being expanded in the fresh drug, these integuments are open to the free passage of liquids. Indeed, there seems to be a decided endosmotic affinity for an alcoholic menstruum, which, therefore, permeates readily the water-relaxed integuments, even if the plant substance is in great slices. This fact is readily shown by placing a few slices of any fresh plant in alcohol, and observing the result. If it be a colored drug like bloodroot, the act of extraction or displacement can be readily seen, and it is shown that the vegetable tissue is very quickly permeated through and through, providing the alcohol is not too concentrated. It requires but a short period to realize the fact that in the natural condition such vegetable structures are easily extracted by alcoholic liquids. (Note 2.)

Many of these vegetable substances in drying become hard, brittle, and almost impenetrable to feasible menstruums. If the substance is exceptionally gummy or mucilaginous, alcohol may be then incapable of thoroughly extracting it, by reason of this impervious envelope of insoluble material, even though the desirable constituents of the drug are soluble in alcohol. Powdering the drug does not altogether obviate the difficulty, although it modifies it; and sometimes even a finely powdered drug of this nature is not capable of extraction with strong alcohol.

In my opinion, many tinctures and fluid extracts now made with mixtures of alcohol and water would be decidedly improved by the use of alcohol alone, were it capable of swelling and permeating the dried plant structure, thus reaching its inner recesses. Hence it is that, in order to satisfactorily extract a drug, we are often forced to bring the material into a condition approaching that of the natural drug, and add water to the alcohol to form a suitable menstruum. Even though alcohol alone is the best solvent for the purified active constituents of some drugs, I hold the opinion, as established in my experience, that to extract these same constituents from the drugs a hydro-alcoholic menstruum is often desirable. Perhaps this feature of the art of extraction has not heretofore been presented in this light; nevertheless it is evident from my experience that there is no other object in using dilute alcohol in many cases where it is certainly preferable to strong alcohol. (Note 3.)

Accepting, then, that water is often desirable as a simple softener of plant tissue, in order that the alcoholic menstruum may more easily permeate the substance of the plant material, the question arises, Is it always best to previously mix the water with the menstruum?

My experience is to the effect that in many cases the operation of percolation is more thoroughly conducted by a deviation from the established methods. I have found it preferable with some drugs to use water sparingly, in a preliminary step, even if the constituent to be extracted from the drug is altogether resinous. My plan, under these conditions, is to moisten the powder by sprinkling it with a small amount of water, from two to three ounces of water to the pound of drug being an average. This moistened powder is then permitted to remain in a closed container for ten or twelve hours, and is then moistened with alcohol, packed in the percolator in the usual manner, and extracted by the usual process. Where it is possible, after the water moistening and maceration, I prefer to use such an amount of alcohol to moisten the powder as will bring the combined amounts of alcohol and water in the drug to the strength of the alcohol that is used afterward to continue the percolation.

For example: If a mixture of two parts of water and three parts of alcohol is to be used as the menstruum, I moisten the drug first with two parts of water; next, after the maceration period has passed, with three parts of alcohol; then, after packing the powder in the percolator, I continue the percolation with a mixture of the same strength, water two parts, alcohol three parts.

If a precipitate in the produced liquid is always objectionable, which I do not now admit, change in menstruum is not desirable. (Note 4.) If the experience others may make in this direction corroborates my own researches, it will be found that the art of plant extraction may, in many cases, be modified in this manner with great advantage.

I would summarize as follows: 1. Use, when desirable, enough water to soften the plant integuments before percolation, spraying the water on the powdered drug so as to avoid lumping.

2. Allow this water-moistened powder to stand in a closed vessel for a considerable period.

3. Where possible, before packing in the percolator, sprinkle it with enough alcohol to bring the liquids to the composition of the menstruum subsequently employed in percolation.

Among the advantages that may be derived from this process, when feasible, is the fact that a coarsely powdered drug may be more easily exhausted than by the usual method.

The part of the query relating to the use of heat as a preliminary step I will try and consider at a future day.

NOTE 1.—I do not overlook the fact that they retain from five to fifteen per cent of moisture when air-dried.

NOTE 2.—In this connection I will remark that green drugs present an obstruction to percolation extraction, in the fact that the large amount of water present in their tissues dilutes a percolate, so that it is impossible to use ordinary maceration or percolation, and without much evaporation prepare a tincture that is representative of any considerable proportion of drug. There is another obstruction in the fact that if the alcohol is very strong it contracts the surfaces to a tough, leather-like substance, which prevents rapid circulation of liquid.

NOTE 3.—The argument may be made that water is used on account of cheapness. This I do not admit in my own work, and I doubt if others consider it. The cost of the menstruum is not a factor with the manager of a laboratory.

NOTE 4.—Upon the contrary, with some irregular preparations that I make, I aim to produce a copious precipitation of inert materials at certain stages of the operation, thus, by judicious manipulation, getting rid of burdens that fluid extracts carry to their injury.

On Wool Fat, or Lanoleum.*

BY C. S. HALLBERG.

THE introduction of the petroleum product, soft paraffin, marked a new era in dermic medication. The discovery of a neutral body of convenient unctuous consistence, indifferent to changes of atmosphere or temperature, not acted upon by chemical agents, was regarded as a very valuable addition to the materia medica. It rendered possible the preparation of ointments not amenable to the reactionary changes which had always been regarded as the *bête noir* of pharmacy. In accord, however, with "the pendular theory," therapists soon recognized that, in attempting to evade one source of error by abandoning lard as a vehicle, they had inadvertently fallen into another, greater error—that the very advantages of petrolatum as a substitute for lard as an ointment vehicle constituted its disadvantages for general employment.

Hager first directed attention to the fact that petrolatum was repelled by the perspiratory pores, and that, therefore, it was not a suitable vehicle for ointments designed for endermic or systemic medication. The fascination of the unchangeable petrolatum had, however, become so deep rooted in medical practice that it was very slowly recognized, chiefly through the researches of Shoemaker, that, while petrolatum served admirably for surface medication as a vehicle for zinc oxide, phenol, and similar substances, it should not be used for the salts of iodine or mercury. The oleates then claimed attention, and, with the oleopalmitates introduced by Shoemaker and Lawrence Wolff (1881), were considerably employed, without, however, fulfilling all the requirements of practice. At this period, about 1885, a purified preparation of the so-called wool fat appeared as the result of several investigations dating back from Hartmann and Schulze (1868) to the most recent contribution of Liebreich that year. This so-called wool fat was shown by Liebreich to be the excretion of the perspiratory glands, directly derived from the keratin tissues under the first skin layer, and consisted of a mixture of cholesterins and fat acids. As such it was offensive in odor and color, and regarded as unavailable unless separated from the fat acids, which constituted about 30 per cent of it. The acids being saponifiable by alkalis, their separation was deemed easy, until it was discovered that the soap formed by the addition of alkali and water had the effect of retaining the cholesterins in the emulsion formed by it, although the cholesterins *per se* were not acted upon by alkalis. Treatment with hydrochloric acid, while separating the emulsion, had the effect of again causing the cholesterins and fat acids to coalesce, rendering their separation impossible. The "bright idea" was then hit upon to separate the cholesterins from the liquid soap by centrifugal power, upon the same principle that cream is separated from milk, the comparative lesser gravity of the cholesterin causing it to rise to the top in a layer in the same manner as cream does on milk. This process was a success, and the creamy cholesterin separated and evaporated until its water percentage was established to be within range of that required to yield an ointment of uniform ointment consistence, constituted "lanolin." The therapeutic uses of the article being confirmed, the name of "lanolin" was trade-marked, and the product patented in Germany, the United States, and other countries.

The patent was granted upon:

(1) The combination of wool fat or cholesterins with water.

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

* Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.

(2) The process for the separation of fat acids and purification, substantially as described in the foregoing.

(3) The sole right to the use of the term "lanolin."

These points if sustained would, of course, give the manufacturer of lanolin the monopoly of all preparations of wool fats for medicinal use.

To this we take exception, substantially for the following reasons:

(1) The so-called wool fat exists *naturally* in combination, and has been used since the time of Herodotus, *always in combination with water*.

[We are compelled, by want of space, to omit the interesting historical proofs given by the author.—ED. AMER. DRUGG.]

(2) The process by the centrifuge is nothing but a *subterfuge*. Purified wool fat with the fat acids serves therapy as well as that without them. The crude wool fat—pure "de gras" imported by the shipload to this country, principally from Marseilles, free from rosin oil, fish oil, and other extraneous fats, selling at about 5 cents per pound—yields an article of as good absorbent power as lanolin when prepared by the following process: 70 parts de gras are freed from grosser impurities by melting and straining. To the melted liquid 20 parts hot water are added, and 1 part potassium permanganate dissolved in 10 parts water, in small quantities at a time, with constant stirring. The mixture should be heated to not exceeding 200° F., and the pot. permanganate solution added in small quantities, waiting with each addition until the ensuing reaction subsides, and when no action further sets in no permanganate solution is added, which may be determined on a watch-glass. The mixture is now thrown into about 400 parts boiling water to which have been added 4 parts hydrochloric acid, and thoroughly agitated, the boiling continued, if possible, by the introduction of steam into the bottom of the mixture. After separating, the water is drawn off and the fat again washed with a similar quantity of boiling water, separated, and the washing once more repeated. Upon cooling of the mixture, the wool fat may be taken out as a wax-like mass. The percentage of water it has absorbed is then determined, and the fat is fused and either evaporated to weigh 100 parts or sufficient water added to it to represent 30 per cent of the entire mass. While yet warm, but upon the point of congealing, the mixture should be triturated until nearly cold. The more thorough the trituration the whiter and firmer of consistence the ointment. With smaller quantities difficulty is here experienced; on a larger scale the ordinary paint mill works very satisfactorily. The product is a body of firm consistence, retained at any ordinary temperature without the addition of wax or paraffin, as has been reported as found in the ordinary patent article, and to that extent detracting from its absorbent power. It has a slightly yellowish-white color, and an odor just perceptible, though not at all disagreeable, of wool. Extended reports from physicians employing it place it at least on a par in absorbent value with lanolin. The process of Gavalowski, extraction of the wool with benzin (deodorized), yields a still whiter product, but the recovery of the benzin from the fat, and especially from the wool, is attended with considerable danger, owing to its inflammable character. The wool freed from fat or sweat by extraction with benzin is of much softer and finer texture than when alkalies have been employed, as in the ordinary wool washing, and commands a higher price. It may be an industry well worthy of investigation upon a large scale. In the extraction of 100 parts wool by this method, about 30 parts fat or sweat are obtained after evaporation of the benzin solvent. The wool, after being dried in the sun, weighs 60 parts; how can the loss of 10 parts be accounted for? was a puzzling question. It was found that the loss of 10 per cent was water combined with the fat extracted with it, and lost in evaporation along with the more volatile solvent benzin! This proves conclusively that the fat exists in nature combined with water in the same proportion for which a patent has been granted. The patent must therefore be void.

(3) The term "lanolin" is too descriptive a name to be given as the exclusive property of any individual. Formed from *lana*, sheep, and *oleum*, or *olein*, oil or fat, it is not an arbitrarily selected or fanciful name, but a *legitimate contraction of the most available euphonious expression of scientific derivation*.

We cannot close this sketch without referring to the value of lanoleum as a pharmonic vehicle, or rather excipient. It holds the same relation in this respect to solid substances or mixtures as glycerin does to liquids, serving as a "binding medium" to fats of any consistence, and for the incorporation of water-soluble substances with those of fatty character, as in ointments, suppositories, liniments, etc.

Its values as a pharmonic agent are alone sufficient to suggest its introduction in the U. S. Pharmacopoeia.

CHICAGO, June 1st, 1889.

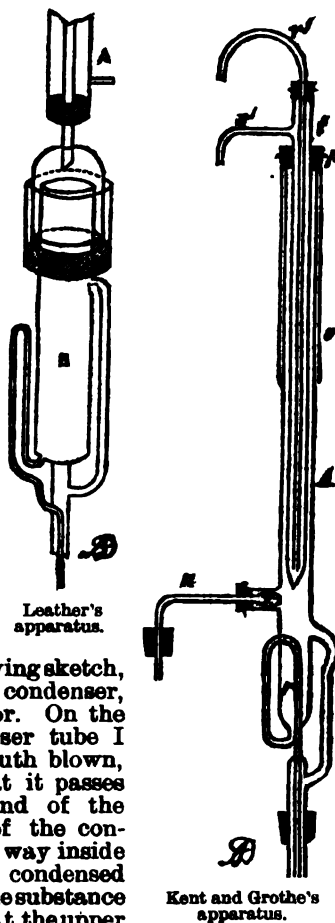
Threatened Exhaustion of Caucasian Petroleum.—Recent reports appear to confirm the gradual but decided exhaustion of the Caucasian petroleum wells. It is said that the Rothschilds have succeeded in getting rid of all their investments in this industry.

A MODIFIED FORM OF SOXHLET'S EXTRACTOR.

DRS. W. H. KENT and O. GROTHE recommend the form of extractor here illustrated. The extraction tube A is made long enough to receive within it the condenser *t*. This is of the modern form, closed below and terminating in a point, while the water enters it through *r'* and escapes through *s*. The substance to be extracted is packed into the space *r*. The object of the outer tube *o* is to insure the correct position of the condenser, which should not be in contact with the inner walls of the extractor. When the volatile liquid is to be distilled off, the tube *n*, carrying a spoon, is pushed in until the spoon is directly under the point of the condenser, whereupon the condensed liquid will flow out through *n*.—*J. Am. Chem. Soc.*, 9, 181.

THE ordinary form of Soxhlet's extractor is attached to the condenser by means of a cork. It is, however, frequently difficult to get good corks, some being so hard as to split the upper part of the extractor, while other descriptions are so porous as to permit the water, which generally collects on the condenser and trickles down to the cork, to enter and thus render the ether extremely wet.

For the idea of substituting a mercury connection for the cork I am indebted to my friend Dr. Vieth, and I am now able, after several months' trial, to give a description of a mercury connection which answers the purpose well. In the accompanying sketch, A is the lower part of the condenser, B is the Soxhlet's extractor. On the lower end of the condenser tube I have had a bell-shaped mouth blown, which is just so wide that it passes readily over the upper end of the extractor, and the end of the condenser tube passes a short way inside the bell mouth, so that the condensed ether drops directly on to the substance which is being extracted. At the upper part of the extractor is a piece of glass tube so wide that it passes readily over the bell mouth of the condenser, and which is fixed at its lower part (that shaded in the drawing) to the extractor by means of cement. An india-rubber ring also makes a good joint in place of cement, but it is generally difficult to get one of the exact thickness. This wide tube, together with the extractor, forms a ring cup into which the bell mouth of the condenser may pass. The ring cup is filled about half full of mercury, and forms, when the extractor is pushed up under the condenser, a perfect joint. The extractor may be held in position by means of a clamp, or it may be readily suspended from the condenser by copper wire.—J. WALTER LEATHER in *J. Soc. Chem. Ind.*



Cleaning Mortars and Graduates.

MR. HANS M. WILDER says: "When I have cleaned my graduates, mortars, etc., thoroughly—at least judging from appearances—I am in the habit of catching the last drop of the final rinsing water on my tongue, and also taking a strong sniff. In this way the last trace of any acrid, bitter, or odorous substance is easily detected, in which case, of course, the washing or rinsing is continued. If substances with marked chemical reactions have been in the graduates or mortars (for instance, salicylic acid, tannin, iron compounds, etc.), I use a few drops of an appropriate reagent in order to make sure of the absence of even traces. When cleaning the scale-pan used in weighing out aniline colors, I always apply at the very last a few drops of alcohol to the apparently thoroughly clean pan, when the merest speck of aniline color will reveal itself instantly.

The idea of keeping separate mortars and utensils for poisons, strongly odorous and bitter substances, is a good one, provided the utensils be marked unmistakably and kept in a separate place. In my store I was in the habit of keeping separate graduates for tinctures of valerian, asafoetida, and spirit of peppermint, which graduates were put behind the respective shelf-bottles on a small tray or a piece of hatter's felt.—*Amer. Jour. of Pharm.*, May, 1889.

What is the Quality of Belladonna Root as Obtained through Reliable Dealers?*

BY W. SIMONSON.

THE material for use in answering this question was obtained through correspondents in Boston, New York, Philadelphia, Cleveland, Columbus, Chicago, St. Louis, Kansas City, San Francisco, and Cincinnati.

Of the specimens, as received, about 8 ounces were ground to number 50 powder, well bulked, and 40 to 50 Gm. powdered in a mortar until less than 1 Gm. failed to pass a number 100 sieve. After well mixing, the siftings, 10 Gm., tightly packed in a small Soxhlet tube, were extracted for four or five hours, when, having changed the receiving flask, the extraction was continued until 15 to 20 C.c. of percolate, evaporated and the residue taken up by one drop of diluted hydrochloric acid, contained not enough alkaloid to react with test solution of potassium-mercuric iodide. The solvent employed is that recommended by Dunstan and Ransom, a mixture of equal volumes of chloroform and absolute alcohol, and the remainder of the assay was conducted as directed by them, except that the percolate was extracted with acidulated water instead of pure water, and that the aqueous solutions of the alkaloids were washed repeatedly with chloroform before making alkaline for withdrawing the alkaloid with fresh chloroform. In ten assays of a good specimen of root (No. 7), seven gave, from 10 Gm., .505 to .512 alkaloids, and in the remaining three the process was varied by drawing the alkaloids from chloroform to acid solution, washing this with two volumes of chloroform, in two portions, making alkaline, and extracting with pure chloroform. These last solutions yielded the alkaloids in crystals, pure white, and giving colorless solutions with 1 C.c. water and 2 C.c. dilute sulphuric acid. The weights were .505, .508, and .503. From this it was assumed that the colored alkaloid is sufficiently pure for weighing, and the weights given below are for such colored residues.

In no instance, when tested with ammoniacal ether, was the powder *completely* exhausted, the additional quantity of alkaloid so obtained showing the previous extraction to have reached 96 to 97%. A specimen of very poor root gave .223 per cent by Squibb's method of assay, carrying the extraction further than he directs, and .220 per cent by the one used for this work; so that the results appended show what would be obtained in liquid preparations of the drug rather than what it contained in fact.

In respect to size and external appearance, the specimens received in the entire state may be separated into three groups, but not sharply divided:

First. Small, 3 to 5 Mm., rarely 7 to 8 Mm., in diameter, very light colored, longitudinal wrinkles shallow; very brittle, fracture short and mealy, seldom compact and horn-like; better specimens mostly split, nearly free from knotty heads and short sections of stems, poorer ones containing these (‡ to †) and partly or not at all split. [In this and the subsequent paragraphs, we have condensed the author's text.—Ed. AM. DR.]

Six samples (1888-1889), containing from 0.220 to 0.365% of alkaloids.

Second. 10 to 15 Mm. in diameter, light brown to brown, longitudinal wrinkles much deeper than in preceding; fracture short, grayish brown to dark brown, mealy or (mostly) resinous and horn-like; knotty heads and stems formed about one-fifth of better specimens, except Nos. 7 and 8, and nearly ‡ of poorest one.

Eight samples (1887-1889), containing from 0.364 to 0.617% of alkaloids.

Third. Diameter 20 to 30 Mm., brown or few light brown, longitudinal wrinkles deep as in the preceding; fracture of roots short, seldom tough and woody; surface rarely mealy, usually resinous and horn-like; large knotty and woody heads, with (few) short portions of stems, formed a large part of all samples except Nos. 15, 19, and 20.

Six samples (1887-1889), containing from 0.310 to 0.776% of alkaloids.

Ground and powdered, sold under label of grinder or of dealer.

Ground.—Eleven samples (1888-1889), containing from 0.290 to 0.750% of alkaloids.

Powders.—Four samples (1888-1889), containing from 0.243 to 0.525% of alkaloids.

Numbers 5, 10, 16, and 19 were collected by Prof. Painter in New York City. Of them he wrote: "These samples I believe to be a fair average of the New York market. Three of the four were obtained direct from the importers, and each was carefully selected as an average sample of a single importation of lots of 500 pounds to 1,000 pounds. The sample from _____ (No. 16) is an average of the stock they had in hand, purchased in this market." Number 5 is sufficiently different from the balance to require mention, inasmuch as it represents a supply that is very widely distributed, and is moderately constant in content of alkaloid. In substance it answers the description given for the first group, is free of stems and tough,

knotty parts of the root, all pieces split, making a very light-colored, clean, and attractive sample. But the proportion of alkaloid is only .365 per cent, being much below the value of a prime drug. Of it the importers say: "The belladonna root is an average fair sample of a 1,000-pound lot. We import it direct from a district where belladonna root is chiefly gathered." As nothing is known regarding the conditions of growth and time of collection, no comment can be made upon it or upon any of the specimens.

In respect to size and appearance, most of the samples fall below the pharmacopoeial description, but those answering it and appearing to have been taken from more mature and fuller-developed plants contain an average of about .5 per cent alkaloids, and would have exceeded this valuation much if more carefully selected and free from lower portions of stems and woody and knotty parts of the roots.

In view of the variable quality of our supply, an authoritative standard of value in alkaloid, for the lower limit at least, is very desirable.

For their prompt aid in securing material, it remains to acknowledge obligations to Messrs. Painter, Trimble, Patch, Bock, Cook, Mueller, Stahlhuth, Federmann, and Buebler.

CINCINNATI, May 12th, 1889.

Hypophosphorous Acid and Ferrous Solutions.*

BY JOHN DEVINE, OF SAN FRANCISCO.

SOON after the last meeting of the American Pharmaceutical Association at Detroit, Professor Painter, the chairman of the section on Scientific Papers, asked me to prepare an essay for this meeting, and the result of my work, the action of hypophosphorous acid (H_3PO_3) on ferrous solutions, is now submitted.

The experiments were commenced November 18th, 1888.

In order to ascertain the minimum quantity of H_3PO_3 that would act as a preservative agent, ten dozen one-ounce vials were labelled in duplicate, with consecutive numbers from one to sixty.

My reason for having them in duplicate was that they might be placed at different temperatures, one of each number.

The hypophosphorous acid I had being insufficient in quantity, I thought of making some, but wishing to save time I sent to a wholesale drug house to get a fifty-per-cent hypophosphorous acid, but could only obtain one of ten per cent. To make myself certain of the strength, I took the specific gravity, and found it to contain only 5.80 per cent of acid.

As I wished to use a concentrated solution, I carefully evaporated it by a water-bath at 120° F. until a twenty-per-cent acid was obtained.

Of this acid, with a very fine burette, I placed nine minims in each of the vials marked No. 1; eight minims in those marked No. 2; seven minims in No. 3, and graduated so that No. 9 had only one minim of H_3PO_3 . [At 70° F. the samples containing from ten to five minims of the twenty-per-cent acid kept perfectly, and at 60° F. all samples containing down to six minims; those below these limits became paler, and the last ones more or less tinged.]

Next I made eighteen ounces of solution of iodide of iron of the same strength, and following the principal directions of the National Formulary, No. 216, page 74.

After filtering the solution and making up for loss, I carefully measured one ounce into each of the eighteen vials containing the H_3PO_3 , and corked them while hot.

One part, numbered one to nine, was kept at a temperature of 70° F.; the other part, with corresponding numbers, at a temperature of 60° F.

As this lot was quite successful, I proceeded to make sixteen ounces of a stronger solution. The first lot contained two hundred and ninety-five grains of iodine and ninety grains of iron to each fluidounce. The second solution had four hundred and forty-two grains of iodine and one hundred and thirty-five grains of iron to each fluidounce, or one and one-half times the strength of the first lot.

I followed nearly the same lines as laid down in the National Formulary in its preparation, and when completed measured one ounce into each of sixteen vials numbered, in duplicate, ten to seventeen, inclusive, each vial containing a specific quantity of H_3PO_3 . [The samples (at 70° F.) containing from ten to four minims of the twenty-per-cent hypophosphorous acid were all in fine condition, of rich green color. A sample with three minims showed a very slight change. At 60° F., the keeping limit was at five minims.]

Being desirous of trying the H_3PO_3 with a weaker solution of ferrous iodide, I then filled sixteen one-ounce vials with a solution of just half the strength of that of the National Formulary, and numbered them, also in duplicate, eighteen to twenty-five, inclusive. [At 70° and 60° F., the samples containing down to seven minims were perfectly preserved. Below seven minims a gradually increasing change occurred.]

* Paper read at the annual meeting of the Amer. Pharm. Assoc. at San Francisco.

* Abstract of a paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco. (The tables in the original have been omitted, and the results given in brackets.)

As I thought I had made sufficient of the ferrous iodide solutions, I determined to try the effect of various proportions of H_2PO_4 on solutions of ferrous chloride.

The first lot of the ferrous chloride solution was of the same strength as that of the National Formulary, No. 218, page 74.

I placed the H_2PO_4 in the vials, different quantities to each number in duplicate, and followed the directions of the National Formulary in making the solution, except waiting till cold to make up the bulk, which I made up with hot water and filtered, and, while still hot, measured it into the vials, numbered in duplicate from twenty-six to thirty-three inclusive. [At 70° and 60° F., the keeping limit was at three minims.]

As in the case of the ferrous iodide, I made another solution of ferrous chloride, following the same lines in making it as in the preceding lot, but one and a half times stronger than the National Formulary directs. [At both 70° and 60° F., the keeping limit was at two minims.]

I also made a solution of ferrous chloride of half the strength of that of the National Formulary. [In all samples containing down to two minims, the original bright green color had faded considerably; otherwise no change.]

All the solutions of ferrous iodide and ferrous chloride were kept at different temperatures. One lot, numbered consecutively one to forty-nine inclusive, was placed at a temperature of 70° F., the other lot, numbered also one to forty-nine, at a temperature of 60° F.

I have tried on two occasions ferrous solutions of different strengths with various solutions of hypophosphite of potassium—it being the most soluble of the hypophosphite salts—but found it utterly worthless. In fact, instead of retarding, it hastened a change very much.

I have also tried H_2PO_4 as a preservative agent in solutions of morphine and strychnine of different strengths. For contrast, I made solutions of equal strength with chloroform water, camphor water, and distilled water.

It was found that H_2PO_4 is of no value in preserving solutions of morphine and strychnine—distilled water in each case being superior.

The next question is, What becomes of the hypophosphorous acid in the solutions of ferrous iodide and ferrous chloride? It is undoubtedly a powerful agent in preventing oxidation in those solutions; but what rôle does it act? What combinations does it form, or what reasons can be adduced for this acid in preventing oxidation or change? This is a difficult question to answer. 'Tis true we can give equations by chemical formulæ showing reactions. But none of these equations are, to me, satisfactory.

I believe, however, that hypophosphorous acid, by combination, forms an acid ether, called phosphinic acid, which, permeating the solution, prevents molecular change.

Contrary to my expectation, I find that the solutions kept at 70° F. turned out better and brighter than those kept at 60° F.; and, also, that concentrated ferrous solutions kept best—even with a relatively smaller quantity of H_2PO_4 .

If they are to be kept for a long time, no doubt highly concentrated ones are best; but, while saying this, I believe that the strength and working formulas in the National Formulary are more practical, and, if prepared with ordinary care, will keep without change for six months or more. If due precaution is used in corking, and the solution kept in small bottles, perhaps a smaller quantity of acid might be used; but, for practical purposes, the formulas of the National Formulary are all that can be desired and cannot well be improved upon.

Notes on Oil Contained in Ground Flaxseed of the Chicago Market.*

BY W. A. PUCKNER.

SOME time since, a sample of ground flaxseed, stated to be East Indian, was given me, with the request that I estimate the amount of fixed oil contained in it. The percentage found, by exhausting with carbon disulphide, was so much larger than the statements of various text-books had led me to expect as to lead me to examine several other samples, the results of which examination are here-with submitted:

The United States Pharmacopœia requires ground flaxseed to yield not less than 25 per cent of fixed oil when extracted with carbon disulphide.

Mr. G. M. Berringer, in the *American Journal of Pharmacy*, June, 1887, states that a sample examined by him yielded 31 per cent, while Mr. Frank X. Moerk (*American Journal of Pharmacy*, December, 1887) obtained 33.5 per cent.

Seven samples of meal, all purchased at retail pharmacies in Chicago, were subjected to the following treatment: 5 Gm. were exhausted in a Soxhlet extraction tube; the flask (Erlenmeyer's) containing the solution of oil in carbon disulphide placed on a water-bath, the CS_2 distilled off

at a low temperature, and the flask dried at 100° C. till it ceased to lose, or rather began to gain, in weight. The yield was:

No. 1.	37.53 per cent.
No. 2.	37.40 " "
No. 3.	37.98 " "
No. 4.	37.36 " "
No. 5.	37.88 " "
No. 6.	36.12 " "
No. 7.	37.38 " "
Average 37.37 per cent.	

Three possible errors, which might lead to such high results, occurred to me: 1st, impurities in the solvent could, perhaps, extract substances other than fixed oil; 2d, the heat employed in recovering the menstruum by distillation might lead to error; and, 3d, that exposure to the atmosphere, while in the drying oven, would, by oxidation of the oil, materially increase the yield. Five Gm. of No. 2 were, therefore, exhausted with stronger ether, the solution evaporated spontaneously and dried as before—the result was 37.12 per cent. To ascertain whether the heat employed in drying would materially increase the yield by oxidation, the flask, after ceasing to lose weight, was kept at a temperature of 100° C. for about two hours longer (the time usually consumed in drying) and the increase in weight noted—it amounted to less than $\frac{1}{4}$ of 1 per cent.

From these experiments, I conclude that the results obtained with carbon disulphide are fairly correct.

If the subject is considered of sufficient interest or importance, I should be glad if other members of the Association would make similar estimations, thus giving the question a wider scope; or I will undertake to examine any specimens sent to me.

CHICAGO COLLEGE OF PHARMACY.

Morrhual (Extractum Olei Morrhue Alcoholicum).*

BY S. A. M'DONNELL, PH.G., SAN FRANCISCO.

AFTER all the use and abuse of cod-liver oil, this town is now being worked in the interest of a French preparation called morrhual. To quote from the brochure on the subject—a short résumé of the process—which consists in treating the oil with alcohol (what kind?) at 90°, the alcoholic solution so obtained yields, on distillation, an amber-brown, bitter, aromatic liquid, partially crystallizing at the ordinary temperature, which is called morrhual. The oil thus treated now resembles any ordinary animal oil (in other words, all the curative properties, therefore, must have been extracted by the above simple process). It is elsewhere explained that the light oil, so popular with the great multitude who resort to its use, is very weak in the percentage of the above product. Now, my experience with most remedies of this class has been that the cleverly devised method of bringing about the grand result desired has been more or less a myth—not practical; the special machinery required only being in the hands of the benefactor of his race, whose sole desire is to become the great medium whence all suffering mankind may reap benefit, etc. Nevertheless I concluded to look into the subject a little.

First: The contents of five capsules were placed in a suitable receptacle and some absolute alcohol added thereto. It dissolved one into the other perfectly. I had expected a failure in this respect; but as further experiments led me to the conclusion that it was an alcoholic extract, I proceeded to carry out the process as laid down in the pamphlet. In these experiments, only the light oil was used.

One thousand grains of oil were weighed out, and a like amount of absolute alcohol, both placed in a very strong twenty-ounce bottle, the cork secured tightly, the bottle placed in a water-bath, which was maintained at a temperature of about 90°, at intervals of several days. The contents were then removed, and, after standing long enough for complete separation, the alcoholic solution was decanted, and the last portions of the same removed by means of a pipette. After allowing the alcoholic solution to stand awhile, one hundred grains of it were weighed out and allowed to evaporate spontaneously (free from dust). The extract weighed three and one-half grains, equal to 3.5%.

The oil residue was then placed in a water-bath—as it smelled strongly of alcohol—and heated to get rid of the alcohol; but such heat was only successful in that respect, as the odor and taste of cod-liver oil were still present, which would indicate that the process of distillation (as recommended) would not remove all the odor from the oil, although the alcoholic extract was richly charged with it. However, the assertions made regarding the process, as laid down in the paper, for preparing morrhual, are tolerably well borne out; but as to the therapeutic value of it I can say nothing. And, furthermore, as the preparation is not a difficult one to make, and on a large scale

* Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.

* Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.

could be furnished (as the same alcohol could be used over and over again) at a reasonable price, would it not be well to give countenance to some such preparation as *Extractum Olei Morrhue Alcoholicum*, with a view of getting out of it anything there might be in it, from a medical standpoint? For should it possess the merit claimed for it, the smallness of the dose would be a very strong recommendation in its favor.

The Behavior of Some New Remedies.

BY S. A. M'DONNELL, PH.G.

In this paper, of several new remedies (so called), an effort was put forth to ascertain if any very prominent behavior would result between them and some of the more common acids of the shop, as a means of identification under adverse circumstances.

REACTION OF SOME NEW REMEDIES (SO CALLED).

	H ₂ SO ₄	HNO ₃	Acid Nitro-Hydrochlor.	HCl	H ₂ PO ₄ conct.	H ₂ SO ₄ dilute
Sulphonol	no change.	"	"	"	"	"
Phenacetin	no change.	Lemon color, developing to an orange color.	Lemon color.	no change.	"	Color darkened a little.
Acetanilid	no change.	"	"	"	"	"
Salol	no change.	"	"	"	"	color darkened a little.
Antipyrine	no change.	Pale amber color, streaked with red.	Amber color, yellowish streaked.	"	"	H ₂ SO ₄ dilute and heat with crystal K ₂ CrO ₇ color darkened some.

From which it will be seen that only two of the things show any particular change. Phenacetin and nitric acid show a reaction; and antipyrine and tinct. iron give a decided change, the former a lemon color and the latter a blood-red color. One grain of phenacetin in half a fluidrachm of water and five drops HNO₃ added (in a slender test tube), and heated to a boiling point, turns yellow (a portion of the phenacetin forming a globule of a deep orange color), the liquid becoming opaque, which, on cooling, congeals into a solid mass.

One grain of antipyrine in 500 minims of water, and one drop of tr. ferri chlor. (U. S. P.) added thereto, instantly produces a color not unlike that of good sherry wine.

For short:

Nitric acid conct. and phenacetin—yellow color.

Tr. ferri chlor. and antipyrine—blood-red color.

Extemporaneous Preparation of Oleate of Morphine.*

BY S. A. M'DONNELL, PH.G.

LATE one evening, some time ago, the following prescription was handed in:

R Morph. Oleat. 10%..... ʒ i.

Sig. Use as directed.

DR. ———

with the remark, "Can you put this up?"

The party was answered: "Certainly; kindly be seated for a few moments." I soon realized I had none of such strength on hand. It was not expedient to send out for it, so nothing for it but to try and make it. 450 grains of oleic acid were weighed out, and about 53 grains of morph. sulph. (no alkaloid in stock)—the excess over fifty grains to allow for the difference between alkaloid and salt in the amount of water of crystallization. The acid and morphine were placed on a water-bath and heated; of course (unlike quin. sulph.), none apparently dissolved. So recourse was had to the ammonia bottle, out of which a few drops at a time were added at frequent intervals, with constant stirring, until a clear solution resulted. This being rapidly cooled and no sediment appearing, so was dispensed, and, I presume, gave entire satisfaction, as *Hail Columbia*, electrically applied, would have followed a failure to fill the bill. I have since experimented with this method of preparing oleate of morphine, and can offer the following as yielding a very satisfactory product. For a 10% solution:

R Acidi Oleici..... gr. 450.
Morphine Sulphatis..... " 53.

Mix, place on a water-bath, apply heat, and add gradually aq. ammon. conc., minims 25, stirring constantly until a perfect solution takes place. Time, about ten minutes in all. Some specimens of morph. sulph. may require a few drops more or less ammonia to effect a solution. The heat dissipates any free ammonia, while any possible resulting ammon. sulph. does not seem to show itself, nor is there any indication of the formation of a soap in view of the nature

of the combination. The mixture is apparently all that can be desired, and I can recommend the process to any one requiring oleate of morphine, the same not being kept in stock.

Commercial Glycerin.

At the recent meeting of the Ohio State Pharmaceutical Association, three papers were presented in reply to one and the same query, viz.:

No. 48. "Examine the different brands and grades of commercial glycerin. To what extent do they meet the requirements of the Pharmacopoeia?"

We shall give a brief abstract of the three papers, only referring to the essential portions.

Mr. Ernest S. Ely, of Barnesville, O., examined fourteen samples representing the products of manufacturers in Cincinnati, Baltimore, and Philadelphia. He applied all the pharmacopoeial tests, many of them with various modifications intended to increase their sharpness and accuracy, and arrived at the general conclusion that, strictly speaking, none of the samples examined fully met all the requirements of the Pharmacopoeia. Even the two purest specimens were found by the author to be a trifle low in specific gravity. The others were found to contain various impurities, though all, or nearly all, of them in very small quantities, due to accident or unavoidable causes, and not likely added by design.

[Among these impurities the author reports to have found traces of glucose, inasmuch as he found that when certain glycerins were tested with Fehling's solution, they gave a faint reaction for this impurity. The quantity thus apparently found amounted to less than 0.25 per cent. We may be permitted to remark that no one is likely to use only one-quarter of one per cent of glucose as an adulterant. And how glucose or any other kind of sugar can accidentally become mixed with glycerin in the factory is incomprehensible to us. In our judgment, the results of the test as carried out by the author must be differently interpreted.—ED. AM. DRUGG.]

Another paper on the same subject was presented by Mr. J. George Spenser, of Columbus, O. This author examined "glycerin in bottles, in fifty-pound cases, in one-thousand-pound drums, and the crude."

As a general result, it was found that all the samples were free from adulterations. A few were a trifle below the normal specific gravity. Among twenty-eight samples, one was found to contain "very distinct traces" of arsenic, another "distinct traces" another "a trace," four "a faint trace," and three "a very faint trace" of the same impurity, showing that the American glycerin is liable to be affected in this manner the same as the European.

Among other criteria used by the author are the three cardinal tests set forth by E. Ritzert (*Pharm. Zeit.*, 1888, 715), which may be briefly stated as follows:

1. Absolutely pure glycerin is neutral.
2. It is perfectly volatile.
3. It does not reduce ammoniacal solution of nitrate of silver even when hot.

The neutrality is determined by litmus.

The volatility is determined by evaporating one drop of glycerin on a glass slide (as proposed by Hager) over a small flame. The spot on which the glycerin has evaporated should be transparent and present only a very faint ring. If the spot is translucent, or brownish, or black, the glycerin is impure.

The third test (ammoniacal nitrate of silver) is best applied as follows: 1 C.c. of glycerin and 1 C.c. of water of ammonia are heated to boiling, and 5 drops of solution of nitrate of silver added to the boiling liquid: no coloration or precipitate should be produced.

On applying these three tests to twenty-three specimens of glycerin, all were found neutral; most were found practically wholly volatile, but none stood the silver test completely, there being in one case a yellow tint produced (without visible reduction, which tint may, however, be due to a faint reduction and suspension of the reduced molecules), while in all other cases there was reduction, slight in eleven cases, and more decided in the remainder.

A third brief paper was submitted by Mr. John J. Buehler, with a table of results, from which it appears that the specimens examined by him, so far as they represented medicinal (colorless) glycerin, fairly came within the requirements of the Pharmacopoeia.

The Alkaline Bichloride Treatment of yellow fever, as suggested by Dr. Sternberg, was carried out during the Jacksonville epidemic of 1888, and Dr. Sollace Mitchell reports that it was very effective. The formula finally used was:

Bicarbonate of Sodium..... gr. x-ix.
Bichloride of Mercury..... gr. ʒi.
Water..... ʒiiv.

Mix. Give ice-cold every hour during the day, and every two hours during the night.

The bichloride has a very powerful diuretic effect and lessens the albuminuria, while the bicarbonate corrects the acidity of the intestinal contents.

* Paper read at the annual meeting of the Am. Pharm. Assoc. at San Francisco.

THE ART OF DISPENSING.

(CONTINUED FROM PAGE 106.)

COATING PILLS.

Silvering or gilding pills is fortunately less common than it was a few years ago. It doubtless adds something to the appearance of the pills, but unquestionably injures their solubility and therapeutic value. When, however, such a coating is ordered, care should be used to have the mass of firm consistence and to avoid the use of powder in rolling. When the mass is to contain asafoetida, sulphur, or the sulphides, not only should the mass be quite firm, but the pills should be varnished before applying the metal, or the latter will soon become discolored. When tolu is used as a varnish, the surface should be moistened with a dilute solution of potash to render it adhesive; but for most other coatings mucilage may be used to cause the metal to adhere. One drop of gum water will com-



monly serve to give an adhesive surface to a dozen pills, and one leaf of silver will cover six 5-grain pills. The wetter the pills the more silver will be needed, and the finish will not be so good. The silvering is done by placing the pills, properly moistened, into a boxwood "silverer" (such as shown in the illustration), together with a sufficient amount of silver-leaf in fragments, and shaking them about until they are well coated and the surfaces of the pills are polished by attrition. In the absence of such a box, a round-bottomed ointment jar answers very well, and collodion will sometimes answer in place of tolu as a varnish.

Gelatin.—Of the many forms of pill-coating, gelatin is the preferable one, owing to the perfection of the coating, ease of manipulation, and to the fact that it is not necessary that the pills should be dried before the coating can be applied.

Several formulas have been published for a gelatin solution for this purpose. Hager's formula for extemporaneous coating consists of 2 parts of white gelatin and 5 parts of distilled water, melted with the aid of a water-bath. When material for gelatin coating is to be kept on hand, 10 parts of white gelatin, 25 parts of distilled water, and 6 parts of 90% alcohol are used, and, after mixture by means of a water-bath, allowed to cool, when it forms a jelly. As much as may be needed of this latter mixture can afterwards be melted with a water-bath. To use either of these solutions, the pills are, one by one, stuck upon a pointed wire, and are dipped into the solution with care not to immerse the wire; the wire with the pill is then to be twirled about for a few moments, and then stuck upright into a pin-cushion, vessel of sand, or a piece of bread. When all the pills are coated they may be removed from the wires.

Another and more expeditious way is to put about 30 drops of the warm gelatin solution into a warm porcelain capsule, then add 60 pills, shake them about until they are all moistened, and then distribute them about on waxed paper as quickly as possible, and allow them to dry for a couple of hours. The aid of an assistant in distributing them is desirable in order that it may be done quickly.

Dr. Symes' formula for gelatin coating consists of French sheet gelatin, 4 parts; water, 16 parts; glycerin, 1 part. Melt with the aid of heat. A board is required into which pins have been pressed so that the points project some distance, and it saves time to have another board with depressions, corresponding to the pins, in which the pills to be punctured can be held. The points of the pins, having been greased, are made to puncture the pills, and then, any scum on the coating solution having been removed, the pills are dipped and are then rotated, to insure an even coating, until the coating has set.

Mr. R. H. Dimock advises 6 drachms of Cox's gelatin and 1 drachm of granulated gum arabic to be dissolved in 14 drachms of No. 8 acetic acid with the aid of a water-bath; add 1 ounce of spirit of nitrous ether and 5 minims of oil of gaultheria, and mix. Make the pill mass a little softer than usual; use as little powder as possible in rolling, and when the pipe is nearly long enough for cutting, lay in front of it a thread long enough to reach over the sides of the pill machine, or cut a slit along the pipe and lay the thread in this. Roll to full length and cut the pills, which can then be kept strung on the thread like beads.

Holding each end of the thread, shake off any adhering powder, and then dip the pills into the coating solution; twirl the thread so as to throw off any excess of solution, and hang the pills up to dry by pinning the ends of the thread to opposite sides of a box. When the coating is dry the thread can be cut close. Some practice is needed to insure good and speedy results by this method.

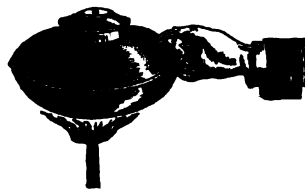
The *Chemist and Druggist* gives the following variation of the method: Into the end of a bottle cork stick a dozen needles so that the points will diverge, and stick a pill on to each point. A mixture for coating is to be made of 4 oz. of French gelatin, 1 oz. of gum acacia, 2 drachms of boric acid, and 40 oz. of water. Macerate the gelatin and acacia in the water for twelve hours. Dissolve with the aid of a water-bath, add the boric acid, and strain through muslin. A sufficient quantity of this stock mixture having been melted, the corkful of pills is to be dipped, withdrawn, and held for a moment to allow excess of coating to form drops. These may be removed by allowing each one to touch the surface of the liquid, after which the cork should be twirled for a few moments and then set aside to allow the coating to harden.

Prof. E. L. Patch says that the following is found by him to be most generally suitable: Best French gold-labelled gelatin, 2½ oz. avoirdupois; distilled water, 7 fl. oz. Macerate until the gelatin softens, dissolve by water-bath, add powdered boric acid, 2 drachms, then slowly add mucilage of acacia (U. S. P., 1880), 2 fl. oz., and strain. Prof. Patch makes the following practical comments:

"Much of the success of the process depends upon having the solution of proper density; the thinner it is the better, providing it gives a complete and firm coating when dry. The warmer the solution the more rapid will be the drying; but judgment must be used in regulating the temperature in each case, for, if too warm, it may soften and destroy the form of the pill, or, in cooling, the gelatin may contract and split or crack. Pills consisting largely of aloes, gum resins, or solid extracts should be made very hard and dipped into a thin, comparatively cool solution. If dipped in too warm a solution the pills will soften, and when the gelatin contracts it will cause the softened mass to protrude from the needle hole.

"Pills containing carbonate of ammonium, citrate of iron, and other scaled salts, valerianates, acetates, alkaline iodides, etc., should also be dipped in cool solution. Glycerin should be avoided as an excipient, owing to its tendency to soften the coating. Glucose forms a good general excipient for pills to be gelatin-coated, and may be used alone with quinine, or with a little powdered extract of licorice for dark pills. A mixture which thickens by keeping should have a little distilled water added from time to time. A pad saturated with petrolatum should be provided, into which the needles may be thrust to grease them before they are inserted into the pills. The needles should be thrust only so far into the pills as to hold them securely, and the pills should be immersed into the coating mixture just far enough to cover them. Excess of coating mixture may be removed by touching the pills to the underheated surface of the cover of the container [or to the surface of the heated mixture]."

Sugar coating may be done extemporaneously, but it is a difficult matter to acquire the necessary skill to rival the work of a confectioner or wholesale manufacturer. One thing should be borne in mind at the outset, which is, that for all work of this kind a very finely powdered sugar, such as is made especially for confectioners' use, is rather essential. The pills should first have their surfaces dry; this is another essential. They may then be put into a tinned-copper bowl (like that shown in the illustration), the inner surface of which has been moistened with syrup



or syrup and gum. The pills are then to be rolled about by rotating the dish, and at the same time the dish is held over a flame so as to warm the contents. Finely powdered sugar is to be dusted on from time to time, and the process continued until a firm, polished coating results.

Another method, recommended by Hager, is as follows: One part of white gelatin is first dissolved in 4 parts of distilled water with the aid of a water-bath. Then a mixture is made of 20 parts of sugar, 10 parts of starch, and 5 parts of tragacanth, and the whole ground to the finest possible powder. About 2 heaped teaspoonfuls of this powder are placed in a box such as is used for silver coating, about 25 drops of the warm gelatin solution are added, and then 50 of the pills to be coated. These pills, having first been dried externally, must be moistened with the gelatin solution just before being placed in the box. The box containing the pills is then to be shaken for about three minutes and the contents emptied upon a sieve. After the powder has been separated, the pills should be again shaken in the box to polish them. If the coating

does not prove of sufficient thickness to render the color of the mass invisible, the operation is to be repeated after the pills have become thoroughly dry and hard. Coloring matter or perfume may be added to the coating powder if desired.

Still another method of sugar coating consists in moistening the pills with a mixture of 1 part of glycerin and 2 parts of alcohol, and then putting them into a coating box containing a very finely powdered mixture of 20 parts of sugar, 3 parts of arrowroot, and 1 part of mastic. Then shake immediately and energetically. Sometimes this method is modified by dissolving 1 or 2 parts of mastic in the alcohol and glycerin.

An extemporaneous and in many cases satisfactory coating of sugar can be given by first coating with white of egg and then rolling about in a suitable vessel with some confectioners' sugar.

Pearl Coating.—An attractive and popular form of coating recently in vogue is produced with powdered soapstone or a mixture of powdered soapstone and sugar. The following points must be observed, viz.: The pills must be hard and dry upon their surface; they must be evenly but not excessively dampened with gum water; and, lastly, they must be thoroughly rotated, first in the powder and afterwards without any free powder, to produce a brilliant surface. By the following method a perfectly finished pearl-coated pill may be turned out in a few minutes: The pills, being fairly hard and rounded, are to be shaken in a pot or chip pill box with sandarach and ether varnish, and then thrown into very finely powdered French chalk contained in another box. Rotate thus for a minute and then separate from the excess of powder with the aid of a sieve. Shake in another chip box with a mixture of equal parts of beaten and strained white of egg, syrup, and water, sufficient to thoroughly wet the pills; then throw them again into an excess of the powder. Shake for another minute and then remove them to a marble slab, where they are to be lightly rotated under a pill finisher, sprinkling on a little more powder, if needed, until a smooth surface is produced. If time permits, they should be dried thoroughly by exposure in an open tray.

Another and somewhat less ready method involves the use of a tinned copper globe, about $5\frac{1}{2}$ inches in diameter. Its halves are fastened together with pins, and two such globes are requisite—one for coating and one for burnishing.

Take 1 drachm each of mucilage of acacia and simple syrup, and add sufficient water to make 1 ounce. Of this pour enough upon the pills to dampen their surface thoroughly (just how much is only known from experience), and after rotating in the coater, in order to distribute the gum mixture thoroughly, add very finely powdered French chalk, and rotate again until the powdered chalk has all been taken up or the pills are thoroughly coated. The pills are then transferred to the burnisher, which may be warmed and slightly coated with white wax, but in this case a third globe will be required for a final polish.

Varnishing may sometimes be resorted to, but is not common in the United States, owing to the facility with which gelatin coating is now done. The residue of tolu syrup dissolved in ether forms a good varnish, 1 oz. of the resinous residue to 3 oz. of the ether being sufficient. Martindale recommends a solution of one part of sandarach in 1 part of absolute alcohol. Hager's formula is 5 parts of powdered mastic and 15 parts of balsam of tolu, to be dissolved in 25 parts of absolute alcohol and 80 parts of ether. The pills are to be placed in a covered pot, and sufficient of either of these solutions to wet the pills is dropped upon them. The pot is then rotated until all the pills have an equal coating. They are best dried on paraffin paper, care being used to see that they do not touch each other.

Keratin derived from horn shavings has been used, on the recommendation of Dr. Unna, of Hamburg, for protecting pills during their passage through the acid secretions of the stomach, this substance being soluble in the alkaline intestinal fluids. Oily excipients alone should be used and a preliminary coating of cacao butter should be applied. The keratin is first dissolved in water of ammonia and evaporated until barely a trace of ammonia remains. Several thin layers of the resulting solution are requisite. The excipient recommended by Dr. Unna consists of charcoal, almond oil, and cacao butter.

A coating which can readily be applied, and which may take the place of the lycopodium, starch powder, or powdered licorice, in which many pharmacists are accustomed to dispense pills, is a great desideratum. The powder is a dirty mess about the table of an invalid, and when carried in the pocket the pill-box is liable to fracture or to become opened and lose its contents, to the discomfiture of the bearer and the injury of clothing. The absence of such powder in packages of manufactured pills is one reason why the latter are popular. As a means for freeing pills from loose powder, a small sieve is convenient.

A contrivance for rapidly counting pills is the invention of A. B. Clariss & Co., of Paris, but something equally simple could readily be made by any one accustomed to the use of tools. The appliance consists of a little scoop with a false bottom perforated with holes which hold a definite number of pills, while the excess roll out through

the spout. The pills are discharged by raising the false bottom and allowing the pills to drop into the scoop, whence they may be emptied into the receptacle. Quite recently a metal-capped bottle, similar to those long since in use in Germany for this purpose, has appeared in the drug trade of the United States, and is becoming deservedly popular as a container for dispensing pills.

(To be continued.)

Insect Pests.

THE *Chemist and Druggist* draws attention to the contents of a pamphlet issued by the Agricultural Department on the subject of insect pests, in the following words:

Considering that the remedies for insect pests are drawn from the chemist's stock, it is opportune that we should recall the fact that the Agricultural Department of the Privy Council has had thorough investigations made of the insects injurious to the corn, hop, and fruit crops. The pamphlet dealing with the last-named is, perhaps, the most useful to chemists, and we strongly recommend all in country businesses to acquaint themselves with its contents. The pamphlet may be obtained from Eyr & Spottiswoode, East Harding street, E. C., by post for nine penny stamps. It is not necessary to discuss here the life history of the common insect pests, the purpose of this note being to indicate to our readers what they may prepare for their customers in the nature of remedies. The old-fashioned white hellebore still holds its position as the popular remedy for caterpillar. In some cases it is unquestionably effectual, in others it signally fails. Failure in many cases is due to improper application. Some gardeners, apparently with the idea of making the caterpillars sneeze themselves out of existence, dust the powder on the plants. This is certainly bad for the gardener. Others mix the powder with cold water, and eject the mixture on the plants. This is better, but the best plan is to direct 5 gallons of boiling water to be poured upon a pound of hellebore, and after the infusion cools it may be applied. Hellebore, owing to its poisonous nature, should not be used for soft fruits. Some one has lately spoken highly of the efficacy of gas-tar as a preventive of caterpillar. It is applicable for plants of the cabbage order, for gooseberry and currant bushes—indeed, for all green garden crops. The time to apply preventives is immediately after the caterpillar disappears. At this stage it becomes a chrysalis, which frequently falls from the plant to the ground, there to remain until the ensuing season. For this reason the gas-tar, soot, lime, paraffin oil, or other preventive should be plentifully supplied to the soil, followed by brisk hoeing. It is a pity that before the advent of hot weather those who are pestered with green fly do not make a search for the predictions of the pest. The fly is always heralded by the appearance of a minute "granulation" of white "eggs" situated on the back of the leaf towards the midrib. At this stage a good washing with a solution of a pound of carbolic soft soap in 10 gallons of water is advantageous, and when the nimble insect appears upon the plants a similar preparation, devised by one of our correspondents, is not only useful, but, unlike some remedies, can be put up as a speciality by chemists. It is as follows:

Terebene (Bond's).....	2 oz.
Soft Soap.....	4 "
Methylated Spirit.....	6 "

Mix together to form a solution.

From 1 to 4 oz. of this insecticide is added to a gallon of water, and the solution used with a syringe or spray producer. For the syringe the weaker solution is sufficient. One of the most efficacious remedies which we know of is a weak solution of crude nicotine. Tobacco infusions and mixtures of tobacco juice with soap and water are commonly used, but they are not at all successful, whereas the nicotine has a marvellously good effect upon rose and fruit trees. Mr. Thomas Christy supplied us with some of the article. It was, apparently, a solution of the alkaloid; and 5 drops, added to a gallon of water, formed a deadly insecticide. As nicotine is one of the most toxic alkaloids, we would suggest that chemists should only sell it in a well-diluted state, so that a few ounces would be required for a gallon of wash. Mr. Whitehead's favorite remedy is a quassia preparation composed of:

Soft Soap.....	7 lbs.
Quassia.....	6 "
Water.....	100 galls.

The whole is allowed to stand together for a night before use. It is the employment of this remedy in the Kent hop gardens which has put up the price of quassia. We prefer to use carbolic soft soap, or any other soft soap which is impregnated with the phenol or creosol products of coal tar. These the green fly and the caterpillar relish as little as they do paraffin, which is sometimes added to the mixture. For retail purposes a combination of 7 pounds of the soft soap with a pound of extract of quassia would be salable. One pound of this mixture would serve for 15 gallons of water. As we are now in the middle of the season for these articles, we trust that the foregoing hints may be turned to good account by those interested.

Properties and Chemical Reactions of Beta-Naphthol.*

Properties.—White lamellæ, melting at 122° C., boiling at 285°-286°; difficultly soluble in cold water; easily in alcohol, ether, chloroform, benzol, glacial acetic acid, concentrated sulphuric acid, and solutions of caustic alkalies. It is soluble in ammonia, forming a colorless, violet-fluorescing liquid, which turns slightly yellow upon warming. On adding peroxide of hydrogen and warming, or allowing it to stand for some time, the solution turns brownish yellow, and, after being supersaturated with hydrochloric acid, acquires a violet color.

On adding ammonia to an aqueous solution of beta-naphthol, and afterwards chlorine water, a yellow-tinted liquid is obtained which assumes a dirty brownish-yellow color on warming. If, however, the chlorine water be first added to the solution of naphthol, a yellowish-white precipitate is produced. This is turned green by addition of ammonia, provided the solution was not too dilute. At the same time a violet precipitate is thrown down which dissolves in ether with violet color, while the remaining aqueous solution has a greenish tint. On evaporating the ethereal solution, a residue remains which is soluble, with blue color, in concentrated sulphuric acid. Addition of glacial acetic acid renders the solution yellowish red.

A dilute solution of naphthol is only colored green (without a precipitate) by addition of chlorine water and ammonia. The green color disappears on warming, and the liquid assumes a yellowish-brown color.

Bromine water produces in an aqueous solution of naphthol a white precipitate which is soluble in ammonia, with yellowish green, and in ether, with yellow color. The residue left upon evaporation of the ether is colored dirty green by concentrated sulphuric acid.

Addition of bromine water to a solution of beta-naphthol, previously slightly warmed and mixed with a drop of dilute ammonia, likewise produces a white precipitate.

Solution of chlorinated lime colors a solution of beta-naphthol yellow; on warming, yellow flakes separate. If ammonia had previously been added, warming produces a dark yellow solution. If this is shaken with ether, the latter assumes only a pale yellow tint, and on evaporation leaves a slight yellow residue which is colored brownish-violet, and dissolved by concentrated sulphuric acid.

Addition of chlorinated soda and ammonia imparts a yellowish-brown color to solution of beta-naphthol. After being supersaturated with acid, the solution becomes turbid and violet. If alcohol or glacial acetic acid is now added, a clear liquid of a fine violet color is obtained which possesses a characteristic absorption spectrum.

A solution of beta-naphthol mixed with a drop of aniline is colored yellowish red by chlorinated soda. On supersaturating with acid, the liquid turns more deeply yellow and becomes cloudy. The turbidity disappears upon addition of alcohol or glacial acetic acid.

Addition of ferric chloride to an aqueous or alcoholic solution of beta-naphthol renders the latter faintly green. On warming, a white precipitate is produced which turns yellowish brown by boiling. If the mixture be afterwards shaken with ether, the latter becomes brownish yellow and leaves on evaporation a yellowish-brown residue, forming a brown solution with strong sulphuric acid.

A chip of pine wood moistened with aqueous solution of beta-naphthol, and afterwards with hydrochloric acid, is rapidly colored green when exposed to the sun, and afterwards brownish red. (This test also holds good for alpha-naphthol.)

Concentrated sulphuric acid dissolves beta-naphthol with yellow color. On gently warming, the liquid becomes colorless. Application of more heat causes first a violet color, afterwards reddish brown, and lastly dirty green. (In the case of alpha-naphthol, these tints appear in reversed order.)

If the solution of beta-naphthol in sulphuric acid is heated until it has become colorless, then allowed to become cold, and mixed with a drop of solution of ferric alum, the subsequent application of a gentle heat produces an intense, handsome, bluish-violet tint, which is changed to yellowish green by glacial acetic acid; at the same time, the liquid has a vivid blue fluorescence.

On adding a few drops of nitric acid to an aqueous solution of beta-naphthol, the latter gradually turns green when examined by transmitted, and brownish red by reflected light. On boiling, it becomes turbid and brownish violet, and clear again upon addition of alcohol, with violet color. If the solution is shaken with ether, it also becomes clear, assuming at the same time a handsome violet color, while the ether becomes pale yellow. On evaporating the ether, the residue dissolves in concentrated sulphuric acid, with brownish-red color.

If Eykman's or Liebermann's reagent is added to a solution of beta-naphthol in concentrated sulphuric acid a brown-red liquid is obtained, which does not change color on addition of glacial acetic acid. Upon addition of water it becomes turbid, but clear again by ammonia, with yellowish-brown color.

On adding to a solution of beta-naphthol in concentrated sulphuric acid a few drops of aqueous solution of glucose,

a black, inky liquid results, which, after being copiously diluted with strong sulphuric acid, becomes bluish black. On standing exposed to the air, this tint changes to dark blue. On diluting with much sulphuric acid, it becomes transparently dark blue. Dilution with glacial acetic acid turns it yellowish green with green fluorescence.

On heating a little beta-naphthol with 0.1 to 0.2 Gm. of oxalic acid and a few drops of concentrated sulphuric acid, a colorless mass is obtained which, when treated with water and ammonia, yields a solution having a strong bluish-green fluorescence.

If beta-naphthol is heated together with phthalic anhydride and a few drops of concentrated sulphuric acid to about 150° C., a brown mass is obtained which, upon addition of water, separates a yellowish-white solid soluble in solution of soda to a yellowish-brown green-fluorescent liquid. If much water is added, the solution becomes almost colorless, but has a brilliant, bright-greenish fluorescence.

Alkaline solution of copper (Fehling's) is not affected by beta-naphthol even on boiling.

Ammoniacal solution of nitrate of silver, to which some soda had been added, is not reduced by it in the cold at all, and but little after protracted boiling.

If a little naphthol (alpha or beta) is dissolved in solution of potassa, then a drop of chloroform or an equivalent quantity of chloral hydrate added, and gentle heat is applied, the liquid temporarily assumes the color of Berlin blue. This reaction occurs even if very small amounts of naphthol are present, though the tint is more easily produced and more permanent in the case of beta-naphthol.

An aqueous solution of beta-naphthol is not precipitated by acetate of lead. Subacetate of lead causes a white precipitate disappearing on warming.

Solution of iodide of potassium and iodine, added to an aqueous solution of beta-naphthol, produces, only after heating for some time, a precipitate which is colorless after addition of hyposulphite of sodium, and which is soluble in ether to a colorless liquid (distinction from alpha-naphthol; in this case, the precipitate, after addition of hyposulphite, has a violet color, and is soluble in ether, with bluish-violet tint).

On Pharmaceutical Assaying.

At the late meeting of the New Jersey Pharmaceutical Association, held at Bridgeton, Mr. August Drescher, of Newark, read a paper on this subject, from which we take the important portions in abstract.

The author confined his discussion to certain drugs and preparations which had come under his particular notice during the past year, in connection with work connected with the State Board of Health. In some of these cases, the U. S. Pharmacopœia does not give any definite "tests," but the law allows the Board of Health to enforce conformity to some other recognized standard, as the U. S. or National Dispensatory, or similar works.

I. TINCTURA OPII CAMPHORATA.

First prepare a standard tincture (using strictly standard ingredients) for comparison with any suspected sample through the following tests:

1. *Acidity.*—Dilute 20 C.c. of the sample with 20 C.c. of diluted alcohol, and titrate with $\frac{1}{10}$ normal soda, using phenolphthalein as indicator (Drescher).

A standard paregoric (U. S. Pharmacopœia, 1880) will require 7 to 8.5 C.c. of $\frac{1}{10}$ soda.

A blank experiment may be made with the diluted alcohol, so as to allow for any acidity that might be due to this.

2. *Specific Gravity.*—This is approximately 0.925 to 0.935.

3. *Morphimetric assay* is impracticable.

4. *Meconic Acid.*—Allen's colorimetric method, particularly when applied to the U. S. Pharmacopœia paregoric, yields uncertain results. Drescher recommends the following modification: Evaporate 20 C.c. of the sample, on a water-bath, with 1 Gm. of freshly ignited kaolin to 10 C.c.; filter, dilute filtrate with water [which should be passed through filter.—Ed. AM. DRUGG.] to 20 C.c., and add 3 drops of a 10% ferric chloride solution. Compare the tint with that produced in an equal amount of the standard tincture.

5. *Foreign Coloring Matters.*—Caramel, red saunders, and cochineal are often used; cudbear rarely.

Solution of subacetate of lead precipitates the coloring matter of cochineal, saunders, and cudbear. The precipitate may be freed from lead by diluted sulphuric acid, the color taken up by a suitable solvent and further tested.

Caramel is best precipitated by kaolin (freshly ignited), from which it may be shaken out with water when it can be evaporated. Or the tincture may be evaporated directly, and the caramel found in the residue as a black or brown, viscid, sweetish mass, after washing with strong alcohol.

The coloring matter of cochineal and caramel are insoluble in stronger ether. Cudbear is slightly soluble in it, and santal red easily soluble. Caramel is insoluble in strong alcohol.

The coloring matters can be further tested with diluted

*After G. Vortmann, "Anleitung zur Chem. Analyse organischer Stoffe." 8vo. Leipzig and Wien, 1889, pp. 149.

sulphuric acid. Cochineal turns yellow; cudbear and saunders do not turn or only *very* gradually. Caramel is not affected, but it is otherwise easily distinguished.

Any color fairly above that of the regular light brown of the standard ought to condemn a suspected article, so that the special examination for coloring matter might be omitted.

6. *Amount of Alcohol*.—Dilute 50 C.c. with 100 C.c. of water, add 3 Gm. of recently ignited kaolin, filter in a closed funnel (to get rid of oil of anise, etc.), distill off 50 C.c., and determine alcohol as usual.

The distillate may contain a trace of camphor, but this is not sufficient to seriously affect the specific gravity (Drescher).

II. POWDERED RHUBARB.

1. The *physical properties* ought to be noted and compared with a sample of known purity.

2. *Amount of Extract*.—This should be prepared with alcohol of 45% (by weight). The yield is about 47%, according to Hager. According to Drescher, the yield varies from 37 to 58%.

3. *Ash*.—This amounts to 12 to 14% (Drescher). Sometimes it is stated to be much higher (43% is reported in the "Pharmacographia," second edition, page 500).

4. *Foreign Coloring Matters*.—These are easily detected according to their nature. Aniline colors may be shaken out with benzol or other solvents. Curcuma is easily detected by the method proposed by Maisch and Howie (see National or U. S. Dispensatories).

5. *Chrysophanic Acid* should amount to 2.5% (Drescher; Hager says 3%).

The author gives three methods: Hager's, Schlossberger's, and his own. He states that none of these isolates the whole of the acid, but that they are sufficiently serviceable for practical purposes.

The author's method is as follows:

Mix thoroughly 5 Gm. of finely powdered rhubarb and 1.5 Gm. of tartaric acid; introduce the mixture into a Tollens' extractor, and percolate with 50 C.c. of chloroform at about 65° to 70° C. Evaporate, take up again with chloroform, evaporate again, and weigh the residue as "chrysophanic acid."

III. JALAP.

The official process of preparing resin of jalap, which is also used as a method of assay of this drug, has not always given satisfaction in the hands of the author, as the resin sometimes would not separate for days from the water. He modified the process as follows:

Mix 5 Gm. of jalap in No. 50 powder with an equal quantity of fine sand, transfer to a filter, and add gradually 250 C.c. of boiling water, keeping the funnel in a hot-water jacket. After draining and drying the filter, remove the dregs, cut out the impregnated portion of the filter, and digest the latter and the dregs in 150 C.c. of hot alcohol. Filter, wash filter with hot alcohol, evaporate the filtrate to a small bulk, transfer to a small beaker, evaporate to dryness, and weigh.

The resin is then further to be tested as to purity, according to the U. S. Pharm. This authority requires 12% of resin, the German Pharmacopœia 10% as lowest limit. The author of the present paper regards both figures as too high for the jalap of our present market, having found 8.5% as the highest limit.

Estimation of Nitric Acid by Means of Ferrous Sulphate.

M. BAILHAQUE has devised an improvement which permits the old method of Pelouze, of estimating nitrates by means of ferrous salts, to be applied with better results than have been possible heretofore. His principal improvement is the substitution of ferrous sulphate for the chloride.

The apparatus to be used consists of a flask of the capacity of 250 C.c. provided with a rubber stopper having two tubes. One of these is 5 to 6 Cm. (about 2½ inches) long, and drawn out to a point at its upper end. The other, which descends to within about ¼ inch of the bottom of the flask, is the neck of a stoppered thistle funnel of cylindrical form, of about 40 C.c. capacity. This serves not only for introducing the solution of the nitrate to be assayed, but also to admit slowly, both at the beginning and at the end of the operation, some solution of bicarbonate of sodium, the carbonic acid gas of which expels the air from the apparatus, and at the end drives the last traces of nitric oxide gas from the flask.

To estimate the quantity of non-oxidized ferrous salt, bichromate of potassium is used, with ferridcyanide as indicator.

The following solutions are required:

1. Solution of ferrous sulphate, containing in 1 liter 100 Gm. of crystallized ferrous sulphate ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) and 75 C.c. of concentrated sulphuric acid.

2. Solution of bichromate of potassium, containing 17.85 Gm. of the pure and dry salt in each liter.

3. Standard solution of pure and dry nitrate of sodium, 50 Gm. in 1 liter of pure distilled water.

4. A cold-saturated solution of bicarbonate of sodium.

The bichromate solution oxidizes exactly its own volume of the iron solution. Both of them correspond to 10.192 Gm. of sodium nitrate in 1 liter.

The assay is conducted as follows: Introduce 50 C.c. of the volumetric iron solution into the flask, together with about 25 C.c. of strong sulphuric acid. Agitate, insert the rubber stopper with tubes all adjusted, and then place the flask upon a hot sand-bath large enough to contain, if necessary, 5 or 6 of these flasks.

Close the stop-cock of the funnel and pour into the latter 25 C.c. of the solution of bicarbonate of sodium. Regulate the flow of this carefully, so that it enters the flask only drop by drop. There will be brisk effervescence until the funnel is empty. Before it is all introduced, pour 10 C.c. of the standard solution of nitrate of sodium into the funnel and continue the heat.

At this moment, the greatest care must be bestowed upon the regularity of the ebullition or effervescence, and the regular evolution of nitric oxide, which must neither be allowed to become tumultuous nor to cease altogether.

In proportion as the solution passes in, the contents of the flask become more and more brown. Before the funnel is entirely empty, the stop-cock must be shut off. When the deep brown tint of the liquid has disappeared, 25 C.c. of the solution of sodium bicarbonate are again introduced into the funnel, and the contents of the latter gradually allowed to enter the flask as before. Now remove the flask from the sand-bath, the stop-cock of the funnel being closed. Allow to cool, transfer the contents of the flask to a measuring cylinder, make up the volume with water (including the washings of the flask) to whatever quantity is desired, and titrate with the bichromate solution, using ferridcyanide of potassium as indicator. [This is most conveniently done by placing a number of drops of test-solution of ferridcyanide of potassium upon a plate of glass laid upon a piece of white paper, and transferring at frequent intervals, during the titration, a droplet of the liquid upon one of the drops of the reagent. When no more blue tint is produced, the oxidation is completed.] The number of C.c. of bichromate consumed gives, by a simple calculation, the percentage of nitrogen in the nitrate of sodium [or the quantity of nitric acid].

In a similar manner the operation is performed when a solution of a nitrate of unknown strength is under examination.

The analytical data furnished by the author are quite satisfactory.—After *Compt. Rend.*, vol. 108, 1122.

Aluminium.

THE following very interesting account of the new process of manufacturing aluminium is abstracted from a lecture by Sir H. E. Roscoe (after *J. Soc. Chem. Ind.*, 1889, 463):

The production of aluminium previous to 1887 probably did not exceed 10,000 lbs. per annum. The magnitude of the undertaking assumed by the Aluminium Company may be estimated when we learn that they erected works having an annual producing capacity of 100,000 lbs. of aluminium. The works now cover a space of nearly five acres. They are divided into five separate departments, viz., 1st, sodium; 2d, chlorine; 3d, chloride; 4th, aluminium; 5th, foundry, rolling, wire mills, etc.

1. Manufacture of Sodium ("Castner Process").

The vessels in which the charges of alkali and reducing material are heated are of egg-shaped pattern, about 18 inches in width at their widest part and about 3 feet high, and are made in two portions, the lower one being actually in the form of a crucible, while the upper one is provided with an upright stem and a protruding hollow arm. This part of the apparatus is known as the cover. In commencing the operation, these covers are raised in the heated furnace through apertures provided in the floor of the heated chamber, and are then fastened in their place by an attachment adjusted to the stem; the hollow arm extends outside the furnace. Directly below each aperture in the bottom of the furnace are situated the hydraulic lifts, attached to the top of which are the platforms upon which are placed the crucibles to be raised into the furnace. Attached to the hydraulic lifts are the usual reversing valves for lowering or raising, and the platform is of such a size as, when raised, completely to fill the bottom aperture of the furnace. The charged crucible, being placed upon the platform, is raised into its position, the edges meeting those of the cover, forming an air-tight joint which prevents the escape of gas and vapor from the vessel during reduction, except by the hollow arm provided for this purpose. The natural expansion of the iron vessels is accommodated by the water pressure in the hydraulic lifts, so that the joints of the cover and crucible are not disturbed until it is intended to lower the lift for the purpose of removing the crucible.

The length of time required for the first operation of reduction and distillation is about two hours. At the end of this time, the crucibles are lowered, taken from the platforms by a large pair of tongs on wheels, carried to a

dumping pit, and thrown on their side. The residue is cleaned out, and the hot pot, being again gripped by the tongs, is taken back to the furnace. On its way, the charge of alkali and reducing material is thrown in. It is again placed on the lift and raised in position against the edges of the cover. The time consumed in making the change is $1\frac{1}{2}$ minutes, and it only requires about seven minutes to draw, empty, recharge, and replace the five crucibles in each furnace. In this manner, the crucibles retain the greater amount of their heat, so that the operation of reduction and distillation now only requires one hour and ten minutes. Each of the four furnaces, of five crucibles each, when in operation, are drawn alternately, so that the process is carried on night and day.

Attached to the protruding hollow arm from the cover are the condensers, which are of a peculiar pattern specially adapted to this process, being quite different from those formerly used. They are about 5 inches in diameter and nearly 3 feet long, and have a small opening in the bottom about 20 inches from the nozzle. The bottom of these condensers is so inclined that the metal condensed from the vapor issuing from the crucible during reduction flows down and out into a small pot placed directly below this opening. The uncondensed gases escape from the condenser at the further end, and burn with the characteristic sodium flame. The condensers are also provided with a small hinged door at the further end, by means of which the workmen from time to time may look in to observe how the distillation is progressing. Previous to drawing the crucibles from the furnace for the purpose of emptying and recharging, the small pots, each containing the distilled metal (on an average about 6 lbs.), are removed, and empty ones substituted.

The temperature of the furnaces is kept at $1,000^{\circ}$ C., and the gas and air valves are carefully regulated so as to maintain as even a temperature as possible. A furnace in operation requires 250 lbs. of caustic soda every one hour and ten minutes, and yields in the same time 30 lbs. of sodium and about 240 lbs. of crude carbonate of soda. The residual carbonate, on treatment with lime in the usual manner, yields two-thirds of the original amount of caustic soda operated upon.

2. Chlorine Manufacture.

The usual method is employed. The gas is led into four gasometers, each of which is capable of holding 1,000 cubic feet of gas and is completely lined with lead, as are all connecting mains, etc.

3. Manufacture of Double Chloride of Aluminium and Sodium.

Twelve large regenerative gas furnaces are used for heating, and in each of these are fixed horizontal fire-clay retorts about 10 feet in length, into which the mixture for making the double chloride is placed. These furnaces have been built in two rows, six on a side, the clear passage-way down the centre of the building, which is about 250 feet long, being 50 feet in width. Above this central passage is the staging carrying the large lead mains for the supply of chlorine coming from the gasometers. Opposite each retort, and attached to the main, are situated the regulating valves, connected with lead and earthenware pipes, for the regulation and passage of the chlorine to each retort. The valves are of peculiar design, and have been so constructed that the chlorine is made to pass through a certain depth of liquid, which not only by opposing a certain pressure allows a known quantity of gas to pass in a given time, but also prevents any return from the retort into the main.

The mixture for the retorts is made by grinding together hydrate of alumina, salt, and charcoal moistened with water, and by means of a pug mill the mass is forced out into solid cylindrical lengths; a workman with a large knife cuts the material into lengths of about 3 inches each. These are then piled on top of the large furnaces to dry. The retorts, when at the proper temperature, are charged by throwing in the balls until quite full; the fronts are then sealed up, and the charge allowed to remain undisturbed for about four hours, during which time the water of the alumina hydrate is completely expelled. At the end of this time, the valves on the chlorine main are opened, and the gas is allowed to pass into the charged retorts. In the rear of each retort, and connected therewith by means of an earthenware pipe, are the condenser boxes, which are built in brick. These boxes are provided with doors, and also with earthenware pipes, connected with a small flue for carrying off the uncondensed vapors to the large chimney. At first the chlorine passed into each retort is all absorbed by the charge, and only carbonic oxide escapes into the open boxes, where it burns. After a certain time, however, dense fumes are evolved, and the boxes are then closed, while the connecting pipe between the box and the small flue serves to carry off the uncondensed vapors to the chimney.

The reaction which takes place is as follows:



The chlorine is passed in for about seventy-two hours in varying quantity, the boxes at the back being opened from

time to time by the workmen to ascertain the progress of the distillation. At the end of the time mentioned, the chlorine valves are closed and the boxes at the back of the furnace are thrown open. The crude double chloride, as distilled from the retorts, condenses in the connecting pipe and trickles down into the boxes, where it solidifies in large, irregular masses. The yield from a bench of five retorts will average from 1,600 to 1,800 lbs., which is not far from the theoretical quantity. After the removal of the crude chloride from the condenser boxes, the retorts are opened at their charging end, and the residue is remixed in certain proportions with fresh material to be used over again. The furnace is immediately recharged and the same operations repeated, so that from each furnace upwards of 3,500 lbs. of chloride are obtained weekly.

4. Aluminium. Reduction of the Double Chloride by Sodium.

This is effected in a large reverberatory furnace, having an inclined hearth about 6 feet square, the inclination being towards the front of the furnace, through which are several openings at different heights. The pure chloride is ground together with cryolite in about the proportions of two to one, and is then carried to a staging erected above the reducing furnace. The sodium, in large slabs or blocks, is run through a machine similar to an ordinary tobacco-cutting machine, where it is cut into small thin slices; it is then transferred to the staging above the reducing furnace. Both materials are now thrown into a large revolving drum, where they become thoroughly mixed. The drum being opened and partially turned, the contents drop out into a car on a tramway directly below. The furnace having been raised to the desired temperature, the dampers of the furnace are all closed to prevent the access of air, the heating gas also being shut off. The car is then moved out on the roof of the furnace until it stands directly over the centre of the hearth. The furnace roof is provided with large hoppers, and through these openings the charge is introduced as quickly as possible. The reaction takes place almost immediately, and the whole charge quickly liquefies. At the end of a certain time, the heating gas is again introduced and the charge kept at a moderate temperature for about two hours. At the end of this period, the furnace is tapped by driving a bar through the lower opening, which has previously been stopped with a fire-clay plug, and the liquid metal run out in a silver stream into moulds placed below the opening. From each charge, composed of about 1,200 lbs. of double chloride, 600 lbs. of cryolite, and 350 lbs. of sodium, about 115 to 120 lbs. of aluminium are obtained. The composition of the metal, as shown by analysis, is 99.2 aluminium, 0.3 silicon, and 0.5 iron.

Eight or nine charges are laid on one side, and then melted down in the furnace to make a uniform quality, the liquid metal, after a good stirring, being drawn off into moulds. These large ingots, weighing about 60 lbs. each, are sent to the casting shop, there to be melted and cast into ordinary pigs, or other shapes, as may be required for the making of tubes, sheets, or wire, or else used directly for making alloys of either copper or iron.

A New Sensitive Ink.

A COMMUNICATION has recently been made to the Academy of Sciences by M. Pechard which throws on the outlook for a novelty may turn to account at once. It relates to the peculiar physical properties of oxalomolybdic acid, which is an acid obtained by adding molybdic acid almost to saturation to a hot solution of oxalic acid. The liquid becomes syrupy, and on evaporation yields crystals of oxalomolybdic acid, $\text{C}_2\text{H}_2\text{O}_4 \cdot \text{MoO}_3 \cdot \text{H}_2\text{O}$. The acid is almost totally insoluble in strong nitric acid, but dissolves in cold water, more rapidly on warming, yielding a colorless and strongly acid liquid. It forms well-defined salts. The strange thing about the acid is that when the crystals are dry they may be preserved unchanged either in sunshine or in the dark; but if moist they quickly become colored blue when exposed to the sun's rays. If characters be written on paper with the solution, they remain invisible in a weak light; but when exposed to sunshine they rapidly become visible, turning to a deep indigo color. This only happens when the solution is spread over paper or other surfaces, for the solution itself may be kept unaltered in the bottle for any length of time, except for a trace of blue at the edge of the meniscus, where, by surface action, a little is spread against the interior glass walls. If a sheet of paper be immersed in a saturated solution of the acid, dried in the dark, and then exposed behind an ordinary photographic negative, a very sharp print in blue may be obtained by exposure to sunlight for about ten minutes. The color instantly disappears in contact with water, so that if a piece of this sensitized paper be wholly exposed to sunlight, one may write in white upon the blue ground by using a pen dipped in water. If, however, the paper with its blue markings be exposed to a gentle heat for a few minutes, the blue changes to black, and the characters are then no longer destroyed by water.—*Chem. and Drugg.*

[The original paper of M. Pechard is published in the *Comptes Rendus*, etc., vol. 108, p. 1052.—Ed. AM. DRUGG.]

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FREDERICK A. CASTLE, M.D.....EDITOR.

CHARLES RICE, Ph.D.....ASSOCIATE EDITOR.

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EDITORIAL.

THE Society of the German Apothecaries of the City of New York has made a praiseworthy new departure by adopting an amendment to their by-laws, according to which a special committee, in conjunction with the president, is charged with the duty of taking cognizance of any actions at law that may be brought against a member of the Society, and to see that the legal adviser of the Society is duly informed of the matter and the facts in connection therewith. All resulting legal expenses will be borne by the Society, excepting in cases where an accused member has been guilty of a positive dereliction of duty. In such a case, the Society will take no action.

It is notorious that the number of frivolous charges against apothecaries for supposed errors committed in dispensing has increased of late years. No dispensing apothecary is safe from such attacks, which generally are instigated by ignorant, illiterate, or misinformed persons. In some cases, it is true, the frivolity of the charges, nay, even their ridiculousness, is clearly brought out when it comes to a trial—if it comes so far. But what is to recompense the accused party for the vexation, annoyance, loss of reputation and patronage, and expenses? Surely an acquittal, however welcome it may be, is no equivalent. Though it may not deter designing persons hereafter from maliciously prosecuting members of the pharmaceutical profession, it will at least make the burden of the defence—if it be an honest one—lighter to bear by making every member of the Society bear a share of the expense. It is merely a sort of insurance association against unjust and expensive legal prosecutions.

It is probably known to most of our readers that many of the harpies who make these attacks do not expect or want the cases to be brought to a trial, as they are aware of the weakness of their cause. But they expect that the accused will make a handsome compromise, preferring to lose a round sum of money privately than to have his name bandied about in public and have legal expenses besides. It is this class of persons that must be chiefly guarded against. And members of the Society should make it an invariable rule and principle never to listen to any proposition for compromise. They should even go further. When they have successfully gained their case, they should strike back, if at all feasible under the circumstances, and sue the accuser for damages for defamation of character.

OUR attention has been called to the fact that the function or scope of the "Digest of Criticisms on the U. S. Pharmacopœia," published by the Committee of Revision and Publication, is in some quarters misunderstood. Probably the preface had not been carefully read. The "Digest" does not contain any criticisms or recommendations by the members of the Committee of Revision in their official capacity, but it was intended to gather up from the pharmaceutical and medical literature printed since 1883 whatever appeared to have some useful bearing upon the Pharmacopœia, with a view towards its improvement. It does not follow, therefore, that because the "Digest" has scarcely any notes on Oleoresins (for example), the Committee of Revision would not have had something to say about these. But this was not the object. If an attempt had been made to gather the individual comments of the members of the Committee, and to print them in connection with quotations from existing literature, it would have been impossible to publish any portion of the "Digest" previous to the next pharmacopœial convention, and possibly it could not have been published at all within any period at which it could have been of use.

In this connection it may be announced that Part II. of the "Digest" is now passing through the press, and will be sent free of charge to all those persons and societies who received Part I. in the same manner. The number of copies remaining of Part I. is sufficiently large to permit additional copies to be sent to those who may require them, under the rules printed in the inside of the cover.

The Swiss Pharmacopœia Revision Commission assembled for the first time, in Berne, on May 2d last, under the presidency of Professor Schär. The order of the drugs in the new Pharmacopœia will be according to the nature of the parts used, and a large number of new forms of medicines, as fluid extracts, tinctures, etc., will be incorporated. The following are the members of the commission: Three pharmacists, Professors Schär and Weber of Zürich, and Buttin of Lausanne; two medical men, Professors Prevost of Geneva, and Massini of Basle; one chemist, Professor Brunner of Lausanne; and one veterinary surgeon, Professor Berdez of Berne.—*Chem. and Drugg.*

The Molybdate Test for Hypophosphites.

ALTHOUGH it has been stated by Winkler (*Ann. Phys. Chem.*, 111, 443) and others that hypophosphorous acid and hypophosphites give a blue color on precipitation with ammonium molybdate, E. J. Millard has never been able to obtain such a reaction with acid, neutral, or alkaline solutions of the molybdate, or he has obtained at most only a faint coloration after a considerable time. On the other hand, he finds that the addition of a small quantity of sulphurous acid renders the test a most delicate one, and one with which the ordinary nitric acid solution of ammonium molybdate answers well. Phosphates, pyrophosphates, and phosphites do not give the reaction when similarly treated. In pure solutions it is possible to detect 1 part of hypophosphorous acid in 2,000.—*Pharm. Journ.* (3), 19, 585.

A Poisonous Derivative from Chloral and Glucose.

A. HEFFTER reports that when equal parts of pure anhydrous glucose and chloral are heated together in a closed vessel on a water-bath, a chemical combination takes place resulting in the formation of two different compounds.

When the heat has been continued for about two hours, the mass appears homogeneous and dark brown, viscid while hot, and almost as hard as glass when cold. This mass was dissolved in alcohol, and the alcoholic solution diluted with much hot water, which caused the separation of resinous drops. The latter were filtered off and the solution evaporated until all alcohol and remaining free chloral were dissipated. It was then diluted with water, filtered, and set aside to crystallize. The first crop of crystals, after purification, appeared in form of thin lamellæ of a mother-of-pearl lustre, which were tasteless and were found to be free from any poisonous qualities. The mother-liquid, on further evaporation, deposits star-shaped groups of needles which, when purified, are white, but little soluble in water (1 in 154), and have a bitter taste. Their composition is $C_6H_{11}O_4.C_2H_5ClO$, or $C_8H_{11}O_4Cl$, there being a loss of one molecule of water [which may be derived from the glucose alone, as expressed by the first formula, which the author of the paper does not venture to assume].

This new compound is very poisonous, even in small quantities, and is being studied pharmacologically at present. Further information is promised shortly.—*After Ber. d. D. Chem. Ges.*, 1889, 1050.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,349.—Ammonin (O. S. P.).

This is a patented article, prepared "by treating carbonate and silicate of sodium with hydrosulphuric acid, and combining the product with sulphide of ammonium," as we are informed. Dr. Meissner, of Vienna, reports that it is composed of carbonate and silicate of sodium and a considerable quantity of sulphides. It is generally supposed that a pentasulphide of ammonium is used in its manufacture, and that this is treated with steam in presence of soda and lime.

It has been found that the water-soluble portion of ammonin (about one-third of it) is a most efficient cleansing and washing agent of textile fibres, readily dissolving and removing fatty matter and dirt adhering to the fibre. Whether it would be of use for general cleaning purposes in factories we do not know.

No. 2,350.—Tinctura Ferri Acetatis, Rademacher (M. A.).

This preparation, which is more often demanded by physicians educated in Germany than by those educated in this country, is supposed to possess special advantages on account of the facility with which it is borne even by delicate stomachs. When well made, it has a fine aromatic odor, somewhat resembling that of Malaga wine, and contains about 1% of iron, calculated as metal.

In giving the method of preparation, we follow Hirsch (Beckurts-Hirsch, "Handbuch d. prakt. Pharmacie").

Dissolve 23 parts of sulphate of iron (ferrous) in 24 parts of distilled water by the aid of heat, and 24 parts of acetate of lead in a like amount of distilled water in the same manner. Add to each solution 48 parts of hot vinegar [or dilute acetic acid] of 6%, mix the two solutions, and add 80 parts of alcohol sp. gr. 0.832. Macerate the mixture in a wide flask for several months until it has acquired a red color, then filter. The sulphate of iron is in excess, but this appears to be intended. The resulting liquid, separated from the sulphate of lead, contains therefore acetate and sulphate of iron, acetic acid, alcohol, and probably some ethers. A certain portion of the iron is gradually separated in form of insoluble compounds, up to a certain but variable limit, beyond which no further change takes place, so that the final product will contain approximately 1% of iron. If the above proportions are used, the final yield amounts to 230 parts, and the sp. gr. of the well-seasoned tincture is 0.982. The long-continued maceration is intended to promote the higher oxidation of the iron which is originally present only as ferrous salt. To facilitate this, the tincture ought to be put into a very wide flask, where it will occupy a layer of little height but wide surface, and the neck be stoppered loosely with cotton, so as to permit a circulation of air. The red color and ethereal odor require several weeks for development.

If the tincture is to be assayed, a portion of it should be concentrated by heat, the whole of the iron oxidized by nitric acid, then diluted, precipitated with an excess of ammonia, and the precipitate washed, dried, ignited, and weighed.

No. 2,351.—Administration of Tincture of Iron (J. B.).

We are asked: "What is, in your opinion, the best method to take or administer tincture of iron, so that it will not leave that puckering, astringent taste in the mouth which is so disagreeable to some people?"

If the official tincture of iron, or any similar iron preparation of decidedly astringent taste, is to be rendered "tasteless," there are various methods by which this may be brought about, but they all depend upon a more or less complete decomposition of the iron salt. However, this is probably of little importance, since more or less decomposition would have ensued in a dose of the tincture even while being swallowed, or shortly afterwards. Among the methods practised there are two which may be recommended more particularly, viz.:

1. When about to give a dose of the tincture or other iron preparation, dilute it with a little water, pour it into a glass of milk, and at once administer it.

2. Or pour the dose into a glass of Vichy water and administer it. In the latter case there will be some effervescence, even if the water was not charged with gas. The effervescence is due to the fact that the resulting ferric carbonate gives off its carbonic acid. The Vichy water used for this purpose should not be the highly dilute "bar Vichy," which generally contains but traces of the salts characteristic of this celebrated water, but one which approaches in quantity of important constituents the genuine, otherwise there would not be enough alkali carbonate present to completely decompose the iron salt.

No. 2,352.—Solanine and Potatoes (Dr. A. D.).

This correspondent asks us to state whether we are aware

of any case in which toxic effects have been ascribed to the eating of potatoes. The latter contain the alkaloid solanine, which is quite energetic in doses of about $\frac{1}{4}$ grain.

In reply, we would say that there is no such case on record. The amount of solanine in potatoes is quite small. Young, fresh tubers contain comparatively the largest quantity. According to Hauf, raw, well-developed potatoes, carefully freed from shoots, contained 0.32% of solanine in May (in Germany), and 0.42% in June; in other months less. When potatoes are boiled with water, nearly all the solanine is extracted by the liquid. Potato skins contain more solanine than the mealy part.

No. 2,353.—Silico-Sulpho-Calcite of Alumina (M. O. S.).

We confess that we were struck with astonishment when we saw this frightful name. But when we were further informed that it was the name of a new homœopathic remedy recently introduced, we speedily calmed down. Regarding its composition we know nothing, and we do not believe that its originator knows any more about it than we do. He may know what crude or refined chemicals he mixed or brought together with intent to make a new compound, but we defy him to prove it to be a chemical individual. Legitimate materia medica is full enough of mysteries and dark corners even now. It is certainly more than folly to add to it compounds of which no one can give any intelligent account. From a note on the article we were furnished with, we learn that it has been given (!) with favorable results in "housemaid's knee," and that it also "took away a dreadful anal itching, piles, constipation, as if by magic." Further comment is unnecessary.

No. 2,354.—Oliver's Peptone Test for Bile (N. Y.).

According to Oliver ("On Bedside Urine Testing," New York, 1885, p. 208), when albuminous urine, acidified by acetic or citric acid, is diluted and run upon jaundiced urine, it will show the presence of bile salts; for, along the plane of contact of the urines, a sharply defined white band or zone of precipitated albumin will instantly appear. In making a practical application of this reaction, Oliver found that an acidified solution of peptone would answer the same purpose as the albuminous urine. He therefore recommends to prepare the test liquid as follows:

Powdered Peptone (Savory & Moore).....	gr. 80
Salicylic Acid.....	gr. 4
Acetic Acid (British Pharmacopoeia).....	min. 80
Distilled Water.....	to make fl. oz. 8

Filter several times until the liquid is perfectly transparent.

The author specially directs Savory & Moore's powdered peptone.

Whether this can be replaced by any other brand with equal results we do not know, but it can easily be tried.

In executing the test, the author recommends to run 20 minims of the urine, which contains bile salts in pathological quantity, into 60 minims of the test solution, when an opalescence will appear proportionate to the amount of bile salts present. This opalescence differs from other urinary precipitates produced by an acidified reagent, in this, that it dissolves completely upon adding a drop or two of acetic acid, and in diminishing but not disappearing on boiling. It seems, therefore, that the free acid already present in the reagent is insufficient to prevent opalescence. We have no experience with this test, but propose to try it upon the first specimen of jaundiced urine available.

No. 2,355.—Guajacol (B. W.).

This is the most valuable constituent of creosote, and has been recommended by Sahli and Fränkel to be used instead of the more variable creosote. The following formulae have been mentioned:

R Guajacol.....	gr. 15 ad 80
Alcohol.....	fl. $\frac{3}{4}$
Aque Destillatæ.....	fl. $\frac{3}{4}$ 6

M. Dispense in a dark amber-colored vial.

Dose: A teaspoonful two to three times daily in water.

R Guajacol.....	gr. 113
Tinct. Gentianæ.....	fl. 3 8
Alcohol.....	fl. $\frac{3}{4}$ 8
Vini Xerici.....	q. s. ad fl. $\frac{3}{4}$ 16

M. Dose: A tablespoonful two to three times daily in water.

No. 2,356.—Ureated (not "Urate of") Mercury (P.).

We are asked what the dose of urate of mercury is. Surely our correspondent made an error, or received a wrongly written prescription, for we never heard of urate of mercury, or of any other urate, being given internally as medicine. There is no doubt in our mind that the compound intended was the so-called "ureated mercury," which is another, commercial name to denote the double chloride of mercury and urea ($\text{CON}_2\text{H}_4\text{HgCl}_2$). This is a salt exceedingly soluble in water, but may be obtained in crystals by dissolving the two ingredients, in molecular proportion, in boiling alcohol. The salt is also called "carbamidated mercury," or "carbamidated bichloride of mercury." It is quoted on some manufacturers' lists,

but seldom kept in stock. The dose would be but little different from that of the bichloride itself. In dilute solution it may also be administered hypodermically.

No. 2,357.—Effect of Temperature upon Volumetric Solutions (R. A. R.).

One of our correspondents asks: "At what temperature are the volumetric solutions of the Pharmacopœia prepared, and will not the results of winter and summer determinations widely differ?"

The U. S. Pharm. did not specify any particular temperature for preparing volumetric solutions, as it was assumed that those who would employ them would be familiar with the general principles of the volumetric method. The Pharmacopœia cannot be a text-book for instruction, but only one of application. Treatises on volumetric analysis usually give sufficiently detailed instructions regarding this and other points, so that a knowledge of them may be presupposed.

There is, of course, no agreement among authors, or among practical analysts, as to the precise temperature at which volumetric solutions should be made. Indeed, it would be quite inconvenient and impracticable to follow a prescribed and rigid rule, as it entirely depends upon the temperature prevailing in the place where the solutions have to be used. Mohr's handbook prescribes a temperature of 17.5° C. for preparing certain of the standard solutions, but this involves the necessity of using the solutions at the same temperature, if any definite volume of them is to contain an absolutely exact quantity of the reagent. In the case of many reagents, a moderate variation of temperature, say of 10 or 15 degrees, makes but a slight difference in absolute accuracy, and generally makes no difference at all in relative accuracy when a solution is compared with or titrated against another which has been prepared at the same time.

In making standard solutions, either in winter or in summer, it is always best to prepare them in the room in which they are eventually to be used, provided the temperature of the room is fairly equal throughout the year. A temperature of 75° to 85°, or as near as possible to 80°, is probably the most suitable. It must not be forgotten that, although a volumetric solution will increase in volume by heat, yet the glass (flask or burette) in which it is contained will also expand somewhat, and the absolute expansion of the liquid in a burette is, therefore, not fully indicated by its apparent increase in volume.

Solutions which are dependent upon each other, as acid and alkaline solutions, iodine and hyposulphite, nitrate of silver and chloride of sodium, etc., must, of course, always be made and used while they are both at the same temperature, though this may vary somewhat at different times. If they are always kept together in one place, and if the solution of the substance which is to be assayed by means of them is also prepared and held at the same temperature as the test solutions, the result will be rela-

tively correct; that is, the volume of the unknown solution which has been found to completely react with the quantity of the standard solution required for the purpose, will contain exactly as much of the substance as the standard solution was capable of indicating at that temperature. If the test was made at the temperature at which the standard solution was made, the result gives the absolute quantity of the substance revealed by the test liquid.

No. 2,358.—"Alkaline" and "Alkali" (J. E. P.).

This correspondent requests us to state what is meant, or rather what should be meant, by the term "*an alkaline citrate*." He is aware of the fact that this term can have two meanings, viz.: either the citrate of one of the alkalis, or any citrate (whether of an alkali or of a heavy metal) having an alkaline reaction to test paper.

We have had several opportunities of communicating our views on this subject, but not in these pages. As it will perhaps interest many others of our readers, and may help to do away with an ambiguity in chemical language, we will briefly state our position.

The adjective "alkaline" has hitherto been used by most writers in two senses, viz.: (1) "belonging to or derived from an alkali," without any reference to any reaction towards chemical test papers; and (2) "possessing the peculiar properties of an alkali, in so far as to produce the characteristic changes in chemical test papers." No doubt many writers have felt the awkwardness of this double meaning, as there are many cases where it would be preferable to leave no doubt in the reader's mind as to which of the two significations is meant. For instance, a writer uses the term "alkaline sulphate," when he may have shortly before had occasion to use the expression "acid sulphate." No doubt most readers would interpret the former as meaning "the sulphate of an alkali"; but there is, nevertheless, a possibility that a writer may wish to speak of an alkaline sulphate, or citrate, or other salt, as one "possessing an alkaline reaction to test paper." It is very easy to avoid this ambiguity without doing violence to the English language. If the word "alkali" be used in an adjective sense, and the meaning of this be restricted to "belonging to, or derived from, an alkali," and the word "alkaline" be reserved for denoting alkalinity as to test paper, etc., the confusion will be removed. We would speak, therefore, of "alkali salts," "alkali carbonate," "alkali phosphate," etc., meaning salts, etc., of an alkali, no matter what their reaction may be. And we would apply the term "alkaline salts," "alkaline sulphate," "alkaline phosphate," etc., to any salts (whether of an alkali or metal) having an alkaline reaction.

Information Asked For.

1. What are the physical and chemical differences between vaseline and cosmoline, as at present in the market?
2. Where can Bertholet's Pepsin (a French brand) be procured in this country?

BIBLIOGRAPHY.

THE DEBT OF MEDICAL AND SANITARY SCIENCE TO SYNTHETIC CHEMISTRY. By PROF. SAM'L P. SADTLER, PH.D. (Reprinted from the Journal of the Franklin Institute). 8vo, Philadelphia, 1889.

THIS is a concise, clear, and systematically arranged résumé of the organic chemicals which have been introduced into medicine during the past decade. Their chemical constitution and their relation to each other, where such exists, is plainly set forth. Altogether the paper deserves to be put on file for ready reference.

A HANDBOOK OF THERAPEUTICS. By SIDNEY RINGER, M.D., etc. Twelfth Edition. New York: William Wood & Co., 1889. Pp. 524, 8vo.

NUMEROUS works are published on the subject of therapeutics, but none of them have yet succeeded in meeting the needs of a physician engaged in the actual practice of medicine so successfully as this one of Professor Ringer's, and whatever books he may please to have on materia medica, medical botany, pharmacy, or the effects of medicinal substances upon healthy men and animals, Professor Ringer's treatise on the uses of medicines for sick people is something which he can ill dispense with. The addition of new matter has necessitated an increase in the size of the page, so that the present edition is of the usual octavo size, rather than the small octavo with which we are familiar.

THE OLD HOSPITAL, AND OTHER PAPERS. By D.B. ST. JOHN ROOSA, M.D., LL.D. Second Revised and Enlarged Edition of "A Doctor's Suggestions." New York: William Wood & Co., 1889. Pp. 320, 8vo.

THIS is a collection of essays, by a most charming writer, upon topics which chiefly aim at showing the relations between the public and the medical profession. It is beautifully printed upon laid and tinted paper with broad margins; is tastefully bound in an olive-tinted muslin, and has its upper edges gilded. It is a book that may be read with profit by the clergy and laity, and especially by that class which assumes to govern our hospitals, schools, and charitable institutions. Its chapters will furnish ideas for the elaboration of inaugural addresses, after-dinner speeches, and similar occasions, and most agreeable reading for a summer vacation.

DIPHTHERIA: Its Nature and Treatment, by E. C. BILLINGTON, M.D.; and INTUBATION IN CROUP and other Acute and Chronic Forms of Stenosis of the Larynx, by JOSEPH O'DWYER, M.D. New York: William Wood & Co., 1889. Pp. 326, 8vo.

SUCH decided advances have been made of late years in our knowledge of diphtheria that this book has a very open field before it. The author has for some years been identified with the study of the disease, and gives us a work which is far from being a mere compilation while not ignoring the writings of others. The section on intubation is a very acceptable addition. The letterpress is excellent and

the illustrations of unusual merit; the one in color, showing varieties of follicular amygdalitis and diphtheria, being particularly good.

HANDBOOK FOR THE HOSPITAL CORPS OF THE UNITED STATES ARMY AND STATE MILITARY FORCES. By CHARLES SMART, Major and Surgeon, U. S. Army. Appointed by the Surgeon-General of the Army. New York: William Wood & Co. Pp. 577, 12mo.

THIS beautiful little pocket manual is announced by its author to be intended to "bring together the various subjects, outside of dispensary work, in which the members of the corps are interested, and present them in such a manner as would render them intelligible to any one who has that dispensary or hospital training which the members of the Hospital Corps are required to have prior to any possibility of promotion."

If any drug-clerk thinks he has too long hours, too small pay, and too numerous responsibilities, we invite him to study the contents of this book and remember that this is required of the military pharmacist in addition to his knowledge of pharmacy.

The contents include: The Service of the Post Hospital, Active Service in the Field, General Hospital Service, A Brief Description of the General Anatomy of the Human Body, and, lastly, the Elements of First Aid, Intelligent Nursing, and Ward Supervision. The whole is elegantly bound in green leather, with a brass clasp, and has the chevron of the corps on the front cover.

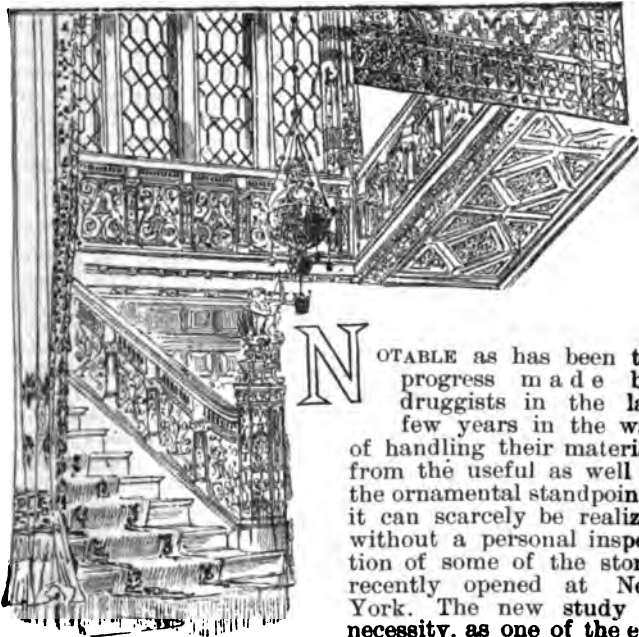
American Druggist

Vol. XVIII. No. 9.

NEW YORK, SEPTEMBER, 1889.

Whole No. 183.

DRUGSTORE ARCHITECTURE AND DECORATION.



NOTABLE as has been the progress made by druggists in the last few years in the way of handling their material, from the useful as well as the ornamental standpoints, it can scarcely be realized without a personal inspection of some of the stores recently opened at New York. The new study of necessity, as one of the elements of good art, has led

to the discovery of the fact that space and time have hitherto been much wasted in drugstores. One of the latest ideas in arrangement is that of using numbers on drawers and shelves instead of names, catalogues being kept to correspond. Thus the druggist can find anything he wants at a moment's notice. Another good idea is to make the colored globes answer the purpose of illumination as well as of advertisement, by placing an electric light inside of them. The retail department of a store in which these two ideas are illustrated is long and rather broad than narrow. The dispensing department is at right angles with it, extending to the left. This department has one show-window, which looks on the side street, and is decorated in an original and appropriate manner. In the middle of the window space is a glass case which forms a pedestal for a tall block of crystallized alum beautifully pure in its different whites. There are small, colorless glass instruments surrounding it. In front of the case, extending across the window, are tall percolators, graduated in height from the middle one. On a colored oak pedestal, at either end of the window, is a large, colorless glass globe containing an electric light. Behind the window is a small oaken table, with a yellow globe upon it, surrounded by medical pamphlets. Just behind the table, facing the store, is placed the druggist's

private desk, also of fine carved dark oak. The dispensing department has a beautiful arrangement of color. Either side of the large, full-length mirror which faces the store are wall casings of oak with bottles and jars filled with deep-toned yellow, red, and brown liquids, relieved against a backing of gold cathedral glass which gleams and shimmers most beautifully with the changing light from the side windows. This idea is carried out throughout the department. The gold-leaf is placed behind the glass instead of in front, and thus a smooth, solid, united surface is presented to the eye. A cabinet between the mirror and the window has yellow silk curtains. The chairs throughout the store are of oak with leather seats.

The dispensing department is divided into two sections by the drug clerk's desk. Back of this desk, filling a large rectangular space, is an enormous two-sided prescription counter, with various attachments, among others an apparatus for distilling water. At the desk end, on the side, are numbered sections forming cupboards, opening from the top, but made to look like drawers. Other drawers in the walls are made with open sides, especially those for the pills and elixirs. These sides are graduated according to the size of the bottle, and thus the contents are at once secure and easily accessible. In the front division of the dispensing department are small, square numbered drawers for herbs. Each holds exactly one pound. At the end of the compounding department is a fume closet in which prescriptions or mixtures having disagreeable odors are put up, in order that the odors may escape into the open air through the ventilating shaft. The ceiling is treated with stamped paper of a pale terra-

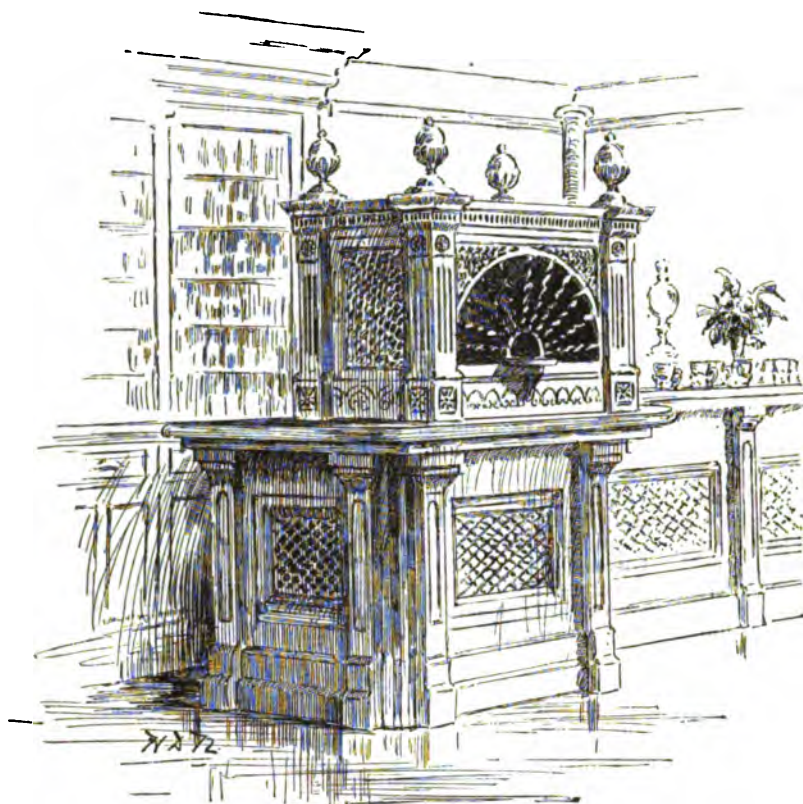


cotta tint, in geometrical designs, and has a border of green in a beaded pattern.

The low flight of steps which separates the retail department of this store from the prescription department has a handsome oaken post at each side. On one is a large crimson globe, on the other a dark red, the color being, as is usual in drugstores, produced by chemically

treated water. In the middle of each globe is an electric light, which, when turned on, produces quite a theatrical effect. The cashier's desk is an elaborate and well-treated piece of furniture, forming an admirable decoration. It is designed partly in twisted and interlaced ropes, and the front presents a fan-like effect of lines. This is probably the most ornamental desk of the kind to be found in any New York drugstore. The soda-water fountain, which is placed against the wall, is unusually handsome with its deep-set mirrors, black wooden framing effectively carved, and its green and white marbles.

By the side of these drugstores, fitted up according to modern ideas of beauty and convenience, the older interiors have rather a *passé* look, but hints may be gleaned



from them in the way of adapting old decorations to the present methods of treatment. One New York drugstore has Pompeian red and terra cotta in the frieze above a light wall. The wall cupboards and casings are in white wood with gilt mouldings. They continue along the back, forming curves at the corners. The prescription desk extends across the back of the store, which is unusually large. It has glass windows hung with cream-colored glass, with a tall red and blue bottle at one corner and a green and yellow one at the other. The carved oak chairs, with their tawny plush seats, belong to a more modern school of drugstore decoration.

Another drugstore presents an example of pleasing window-decoration, produced by a skilful arrangement of stock. A large, squat, colored jar is supported in the middle of each window by solid brass rods, one starting from each of the four corners. In one window is seen a tasteful grouping of brushes. In another, sponges fill a case, upon the top of which stand large bottles of lavender water, which, with their clear emerald-green bodies and white kid tops, look like a company of soldiers mounting guard over a heap of delicate, painted, satin perfume sachets. A feature of the interior is the presence of three tall, white jars, with rich colored coats-of-arms on them and gold tops, on a slab at the foot of a long mirror. A large, white jar of mineral water standing on a brass pedestal is a decorative feature of the soda-water counter, which is in brownish marble. Tiles are effectively introduced into the decoration of the soda-water fountain, which is composed of green and salmon-colored marble. There is one soda-water fountain in a New York drugstore which is made entirely of tiles in shaded light greens, with heads in relief and bright silver finishings. This is a great improvement on the old-fashioned, heavy marble fountains, which were the very reverse of suggestive of coolness and freshness. It is by such details as this that the advance of art, as applied to the daily exigencies of American life, may be gauged. The ceiling of another drugstore is covered with a velvety paper in which there are stars of pale green formed by geometrical ribbon interlacings of a greenish white. The wall casings are of white painted wood with gold trimmings. Pale green tiling might be very effectively used throughout this store. The tile idea is worth considering by druggists who meditate refitting their stores, for its decorative possibilities. Many hints may be gleaned from other stores for the arrangement of drug establishments. A New York liquor store has its window space floored with figured and

shaded tiles in greens and mahoganies. The pillars supporting the roof of the windows are carved in Moorish designs and painted in delicate colors. A loose, hanging screen of long beads and bits of bamboo, such as can be purchased at a Japanese shop or made at home, is used to conceal the interior of the store, and large palms in jars form the decorations. There is, besides, an enormous champagne bottle, which in the case of a drugstore might be changed to a colored glass jar.

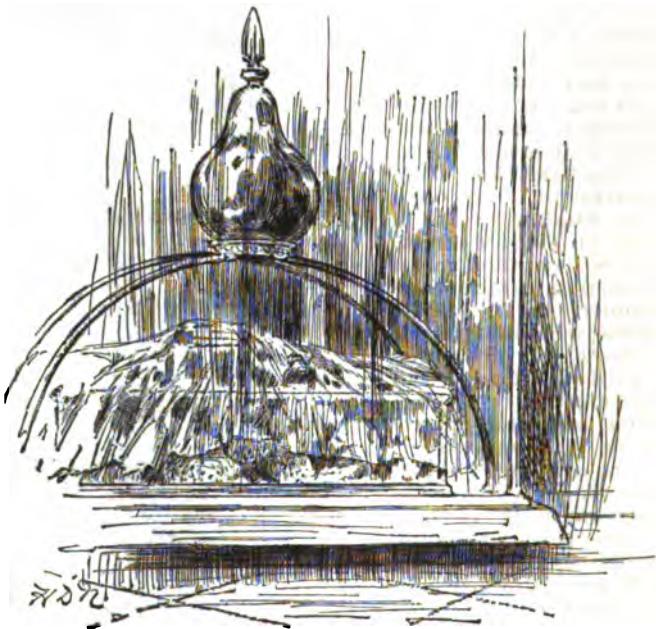
Copal.

THE term copal is commercially applied to various hard gum resins yielded by certain tropical and subtropical trees. In the majority of cases, copal is obtained in a semi-fossil state on land where no trees at present are found, but where, at one time, large forests existed. In other cases, what may be termed recent copal is a gum resin in a comparatively fresh state collected from living trees or from trees in a state of decay.

There are numerous commercial distinctions between varieties of copal. It is unnecessary here to do more than draw attention to some of the chief plants yielding these substances. Zanzibar copal, or Anime, one of the most valuable of any now used in commerce, is obtained from *Trachylobium Hornemannianum* Heyne. Sierra Leone copal is derived from *Copaifera Guibourtiana* Benth. What are known as Lisbon copal, recent and fossil; pebbly copal from Accra, on the Gold Coast, and Benguila copal, are all probably furnished by species of *Copaifera*, but material for their determination has not yet been received. Sierra Leone and other fossil African copals are the foundation of all fine varnishes. The locust tree of tropical South America (*Hymenæa Courbaril* L.) yields a resinous substance resembling gum anime, which is found in masses in cavities and at the bases of old trees. The well known Dammar, or Kauri gum of New Zealand, is yielded by *Dammara australis* Lamb. This is extensively excavated from the sites of old forests, and the exports from New Zealand in 1883 were 6,518 tons, of the value of £336,606. Indian copal, or white dammar, used in varnish on the Malabar coast, is obtained from *Vateria indica* L. Black dammar is the produce of *Canarium*

strictum Roxb.

Towards the end of 1888, a new source of copal was discovered in southeast Africa, which has created a good deal of interest. The native name of the gum, according to Heathcote, is stakate or staka; the Zulu name is inthlaka. It has a beautiful odor when pounded or burnt, also if boiled in water. From specimens of the tree re-



ceived at Kew, Prof. Oliver believes the latter to be *Copaifera Gorakiana* Benth. The trade name of the gum is Inhambane copal.—*Exp. Mag.*

The German Pharmacopœia.

The subcommittee of the German Pharmacopœia Commission recently held a session lasting eight days. The proposed changes were fully discussed, among them being a list of ninety-nine articles to be added. The Commission will probably assemble in October, and begin active work to prepare a new edition of the official Pharmacopœia.

Examination of *Fabiana Imbricata* (Pichi).*

BY M. ROCKWELL, SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN.

Synonym. Pichi.*Part employed.* Leaves and stem.*Natural Order.* Solanaceæ.*Habitat.* South America.

Uses.†—Pichi is especially efficacious in diseases of the urinary apparatus and of the liver. In cases of vesical catarrh, acute or chronic, following a mechanical cause, such as gravel or calculus, or uric diathesis, this remedy will quickly modify the urinary secretions, calm the irritability, and favor the expulsion of the gravel and calculi that can be passed through the urethra. It also modifies and cures chronic purulent mucous secretions. Its action on the affections of the liver must be attributed to its diuretic properties, though it is recommended for hydropsy and dyspepsia due to insufficient biliary secretions; but the specific action of pichi is directed without doubt upon the organs of the urinary apparatus. It is used in the form of a fluid extract in a dose of four (4) to six (6) spoonfuls per day in cold or warm water.

Description.‡—Pichi is a small shrub, about 6 feet high, frequently met with in Chili and the Argentine Republic, where it grows spontaneously, and is also used as an ornamental shrub. Its many small branches are covered with broadly ovate, very thick leaves about one-twelfth of an inch in length, the bases and margins of which are coated with a whitened, resinous deposit. The resin-like odor, arrangement of leaves, and the general aspect seem to classify it with the family of Coniferae; but on examination of the few white flowers which we find at the extremity of the branchlets in the second year, it is to be placed in the natural order Solanaceæ, sub-order Cuvembryæ, and tribe Nicotianæ.

The wood is of a uniform yellowish color, heavy, hard and very fine grained. The relatively thin bark is of a light gray color, finely roughened by small, short, sharp longitudinal ridges, which exhibit under the lens a peculiar resinous lustre.

Chemical Examination.—By treating one hundred and fifty (150) Gm. of the finely powdered drug with seven hundred (700) C.c. of Prollius' solution, and allowing it to stand twenty-four hours, I obtained an *etheral* liquid, from which acidulated water removed a substance that is precipitated by the general alkaloidal reagents. This substance was purified as much as possible by repeatedly shaking it out in chloroform, ether, and acidulated water. The resulting 0.01 Gm. of substance was a slightly brown, non-crystalline bitter principle, capable of forming crystalline salts. Two of these salts were prepared, their crystalline form studied microscopically, and photographs and drawings made of them. Attempts to crystallize the sulphate did not prove satisfactory. The chloroformic solution of the free alkaloid when evaporated to dryness emits a peculiar offensive odor; after being heated for about one-half an hour on a water-bath, the odor had entirely disappeared, and there was a loss of weight of 0.0013 Gm. Whether the loss is due to some volatile impurity or to a certain volatility of the alkaloid was not determined.

The qualitative reactions of the alkaloid are as follows:

First, on the free alkaloid in solid form.

Sulphuric acid dissolves it, producing a dark yellow solution.

Nitric acid dissolves it, producing light yellow solution.

Second, reactions of solutions of the salts of the alkaloid.

1. Mayer's reagent gives a white, amorphous precipitate.

2. Bromine water gives a dirty white, amorphous precipitate.

3. Test paper, prepared by wetting filter paper with a mixture of ferric chloride and potassium ferricyanide, is turned blue at once.

4. When a drop of the hydrochloride solution of the alkaloid is placed in a dilute solution of potassium permanganate, very deep greenish-blue lines are seen to form throughout the permanganate solution. This blue color soon changes to a brownish-yellow.

5. Ammonium hydrate gives a precipitate soluble in excess of reagent.

6. Picric acid gives a yellow precipitate.

7. Gallic acid gives a slight white precipitate.

8. In concentrated solutions, mercuric chloride solution gives a slight white precipitate.

From the above reactions, and numerous others which gave negative results, it seems that a new alkaloid is present in the plant. To satisfactorily prove this, it is necessary to make an ultimate analysis of the alkaloid, determining what elements are present and in what proportions they exist. To do this it will require a considerable quantity of the drug, since, according to Dr. Lyons,§ the alkaloid amounts to less than 0.1 per cent of the drug.

By treating five (5) Gm. of the powdered drug with fifty (50) C.c. of strong ether, in a constant-extraction apparatus, an ethereal solution was obtained which yielded 1.716 Gm. of extractive matter. This was treated with cold potassium hydrate, which dissolved the greater part of it. The alkali solution was then poured into a large volume of acidulated water, which precipitated a considerable quantity of resin. This resin, when dry, was of a brown color, and soluble in absolute alcohol. The residue of drug, after extraction by ether, was acted upon by fifty (50) C.c. of absolute alcohol in an extraction apparatus. The alcoholic solution was poured into a large volume of acidulated water, which precipitated a very light yellow resin, about equal in amount to the resin obtained from ethereal solution. This resin, when treated with ether, yields a greenish solution, the color, probably, being due to the extraction of chlorophyll. This green solution, when poured into acidulated water, produces only a cloudiness, not a definite precipitate. These experiments seem to indicate the presence of *two* resins in the plant, both soluble in absolute alcohol, but the alcoholic resin almost if not entirely insoluble in ether. The resin from the alcoholic solution is also lighter in color.

A tincture of the drug was made with absolute alcohol, the resin precipitated by pouring into acidulated water, and filtered. A small portion of the filtrate gave a blue fluorescence when rendered alkaline. To the filtrate was added subacetate of lead in excess, which precipitated a lemon-yellow substance, partly soluble in acetic, entirely soluble in dilute nitric and hydrochloric acids.

The filtrate from the subacetate of lead precipitate was freed from the excess of lead by hydrogen sulphide, filtered, and this second filtrate concentrated. Now to a small portion of it a few drops of sulphuric acid were added, and the mixture boiled for some time. Then it was neutralized with potassium hydrate, and again boiled with Fehling's solution, which resulted in the reduction of the latter. Hence it appears that there is a glucoside present in the plant.

On adding an alcoholic solution of ammonia to an ethereal tincture of the drug, a bulky white, amorphous precipitate was formed, soluble in excess of reagent. On standing, the precipitate became crystalline, the white acicular crystals sometimes forming rosettes. These crystals are insoluble in water, acids, and alkalies, readily soluble in ether, chloroform, an excess of strong alcohol and hot dilute alcohol, from which they again crystallize on standing. It is a substance rich in carbon, tasteless, and, as Dr. Lyons says, probably inert.

By repeated trials it was found that ether extracts about 35% of the drug. This extract is a soft resin in appearance, and, on being subjected to a temperature of 100° C., loses about twenty-three (23) per cent of its weight, due, probably, to the presence of a volatile oil and some moisture. Hot water dissolves about fifteen (15) per cent of the ethereal extract, the solution being of a yellowish-green color, with a bitter taste resembling the taste of the drug. The water solution when rendered strongly alkaline shows a blue fluorescence.*

This fluorescent principle I have not been able to obtain in a pure state, but the observations I have made upon it are that it is quite soluble in ether and chloroform, slightly soluble in cold water, more freely soluble in hot water. The blue fluorescence is brought out only in alkaline solutions, and is destroyed by acids.

By treating fifteen (15) Gm. of the finely powdered drug by dry distillation, gradually heating till the temperature had been raised to 150° C., I obtained a small quantity of a volatile oil of rather a pinkish tinge. It was so small in quantity, however, that I was not able to ascertain many of its properties. By treating it with strong sulphuric acid it is changed to a dark brown solution. Fuming nitric acid gives a brownish-red solution.

Hydraceticin in Psoriasis.

It will be remembered that in a recent notice of hydraceticin, the purified representative of "pyrocin," it was mentioned [see our July number, page 134] that Dr. Guttman had reported that he had used a 10% ointment of it successfully in the treatment of psoriasis (*Pharm. Journ.*, June 29th, page 1049). More recently, Dr. Oestreicher also reports that he has used a 20% lanolin ointment of hydraceticin with the best results (*Apot. Zeit.*, July 20th, page 763); but he qualifies this statement by the important observation that in every case, after using the ointment from seven to ten times, severe symptoms of poisoning were set up: The patients complained of constantly increasing exhaustion and weakness in the limbs, accompanied by the impression that a serious illness was impending. The urine was of a mahogany color, with a greenish tinge, but no biliary coloring matter could be detected in it. Dr. Oestreicher is, therefore, of opinion that a substance that is capable of producing such symptoms requires to be subjected to more prolonged clinical observation as to the necessary limits of doses before it should be recommended for general medicinal use.—*Pharm. Journ.*

* Abstract of a paper read at the meeting of the Am. Pharm. Assoc. at San Francisco. (The illustrations showing sections of stem, etc., have been omitted, together with corresponding text.)

† Medical Age, 1886, IV., 118.

‡ Dr. Henry H. Rusby, 1886, Therapeutic Gazette [8], I., 810; Medical Age, 1886, IV., 118.

§ Dr. A. B. Lyons, Amer. Jour. Pharm., 56, 66.

* Dr. A. B. Lyons, 1886, Amer. Jour. Pharm., 56, 66.

Note on Oleite.

At the recent meeting of the Amer. Pharm. Association at San Francisco, Mr. Fred. B. Kilmer read a paper on "Pharmacy as Applied to Preparations for the Skin," from which we take that portion which treats of *Oleite*.*

The substance named oleite is chemically a sulpho-ricinoleate of soda. It is prepared from castor oil by treating it with sulphuric acid at a low temperature, when a compound of sulphuric and ricinoleic acids is formed. The free sulphuric acid being removed by washing, and any unchanged oil by ether, the resulting sulpho-ricinoleic acid is then neutralized by sodium hydrate, the finished product being a transparent, jelly-like liquid, with little odor, acid taste, soluble in water, alcohol, chloroform, and essential oils. (For a more extended description of such substances, reference may be had to the U. S. Dispensatory, 16th edition, page 1025, and a paper by Dr. A. Mueller-Jacobs in *AMERICAN DRUGGIST*, Feb., 1884.)

Substances similar in composition, known as "poly-solve" and "solvine," are now upon the market, and a compound known as "Turkey-red oil" (Türkisch Rothöl) is in use as a mordant, but their resemblance, as far as utility for the purpose under consideration is concerned, is only in appearance, as far as the writer's experience goes.

Turkey-red oil contains a large amount of unchanged oil, water, and sometimes free acid. It has little or no action as a solvent for drugs.

Specimens of "solvine" or "polysolve" examined by the writer likewise contained unchanged oil, water, and were not neutral, some specimens being highly acid, others alkaline, and upon many drugs acted energetically and destructively. They had a decided odor of castor oil and a highly acid taste, and a purging, cathartic action on the system.

Dr. Jacobs, in his article heretofore referred to, shows that the salts or compounds formed with sulpho-ricinoleic acid are of two series: the salts of the alkalies, and the acid salts of alkaline earths, being water-soluble, while those of the neutral metallic salts appear in the form of amorphous, lake-like precipitates, insoluble in water.

The behavior of oleite towards drugs seems remarkable. When first experimenting with it, the writer was reminded of the dream of the alchemist in search of a solvent which would dissolve all substances. It is a solvent for at least a small percentage of almost any drug that it might be conceived would ever be wanted to be used with it. When the limit of its solvent power is reached, a very large amount is emulsified so as to be readily miscible with proper vehicles for use.

Oleite, being already a neutralized, water-soluble substance, will, to a varying degree, form water-soluble compounds with drugs; but in compounds with an excess of heavy metallic salts, it suspends them in an amorphous form which I have termed emulsions, and produces different results than a simple union of sulpho-ricinoleic acid or oleic acid with a base.

The behavior of oleite toward drugs is so varied with each substance that the writer is not able to state at present what changes take place chemically. With some drugs it seems merely a solution; with others, as heretofore remarked, a union of the sulpho-ricinoleic acid and base is formed.

Its action with mineral and alkaline salts has been already spoken of; with iron, lead, zinc, and mercury, percentages varying from two to ten are completely soluble. Nearly all of the alkalies are dissolved in quite large proportions. Gums and resins are somewhat soluble and, to a limited extent, made water-soluble. Solid extracts form clear solutions, miscible with diluents. Iodoform and iodine are completely dissolved. Owing, doubtless, to the neutralizing base used, iodine loses much of its color, and its solution in oleite does not stain as much as an alcoholic solution. Iodine stains upon the hands, clothing, and utensils are readily removed by oleite. The same is true, in a less degree, with stains of chrysarobin.

(Dr. Jacobs says that the discoloration of iodine and bromine by such a compound is due to the action of sulphuric acid, whereby two atoms of the halogens are absorbed by one molecule of the acid; that is (he says), simple addition takes place, with the formation of bromine and iodide substitution products of the fatty acid series.)

Oleite seems to differ from oleic acid, from the fact that the base, castor oil, contains no oleic acid, and castor oil yields no palmitic acid upon saponification, and by the process of manufacture no stearic or palmitic acid should be present. Oxidation does not seem to take place in oleite as in oleic acid. Oleite is water-soluble, while oleic acid is not. This gives it some advantages, as its compounds may be removed by cold water.

The experiments with this substance have not been exhaustive, and in but few cases have the percentage of solubility, or the chemical changes, been noted with sufficient

accuracy to warrant definite statements, and its therapeutic application will only be spoken of.

The wide range of substances which may be dissolved or be brought into a condition to more readily penetrate the skin, certainly would claim for it a useful place in our materia medica. For if epidermic or dermic medication is of any use, it is reasonable that the more soluble the drug the more energetic will be its action. Therefore a much larger class of drugs can be applied in this way than has heretofore been possible.

Clear oleite applied to the skin in a very thin layer, while for a few seconds sticky, rapidly passes through the skin, leaving the skin dry, giving one the impression, if not clearly watching, that it has evaporated.

The action of oleite is largely due to its affinity for liquids, whereby the layer of air upon the surface of the skin is displaced, and a close contact established between the oleite and the glands and follicles, and absorption rapidly follows; also to the slight saponifying action of the oleite, whereby the fatty exudations of the skin (dirt and other matters) are emulsified, and their power to prevent absorption removed. (See Knapp's "Lehrbuch der Chem. Technologie" on action of saponifying agents upon the skin and fabrics.)

There is, doubtless, also a combined chemical and mechanical action between acids, fatty compounds, the liquids of glands and follicles, whereby their strong affinity causes them to rush together, so to speak. In experiments with sulpho-oleic acid, the writer has, under certain conditions, secured absorption so rapid that it was painful.

When alkaloids, or solid extracts containing alkaloids, are made into a solution with oleite, their action is greatly heightened, so much so that in experiments it has been necessary, in making preparations containing aconitine, atropine, veratrine, etc., to greatly reduce the strength. The same is true of iodoform and iodine. A very large amount of either of these can be employed in the ordinary way with a moderate effect; but with solution in oleite, iodoform produces poisoning symptoms, and iodine, eruptions, with what would be considered very weak solutions. Solutions in oleite of the metallic salts in large amounts are sticky, yet when applied to the surface and allowed to remain, are all absorbed within a prescribed limit. A noticeable feature of solutions in oleite is that they do not spread or run over adjoining surfaces.

Whether the use of oleite as a means of epidermic medication will ever come into extended use the writer is not able to judge. In experiments made by physicians in connection with the writer, they have demonstrated that drugs dissolved in oleite act very energetically, that the amount required to produce certain effects is nearly the same as if administered hypodermically. In these experiments, solutions of extract of belladonna produced characteristic action in very small amounts. Constitutional effects of mercury have been reported to the writer from the use of solutions in oleite. Very marked action was obtained from alkaloids. These experiments were not sufficiently accurate to detail here, and are only mentioned in a general way.

The statements as to the action of the ricinoleites upon tissue and blood corpuscles that have appeared from time to time were probably based upon the preparations "solvine" and "polysolve." Oleite has no such action. Careful experiments made by the writer, aided by physicians, show that the contrary is true. Upon cuts, burns, open wounds, aggravated skin troubles, highly inflamed surfaces, its effects are soothing, mild, and healing. It has been freely absorbed into the system, and taken internally without the slightest irritation. The only disadvantage that is known to the writer which would prevent its being applied as a solvent for drugs to be exhibited for epidermic medication, is that preparations made with oleite and a drug simply are very sticky, and in the case of metals with drying properties, mercury, zinc, lead, etc., unless oleite is in large excess, they harden by time. Many who have made a compound with a large percentage of such a drug as oxide of lead, then undertaken to apply a thick coating as they would of a cerate, ointment, or plaster, have found such a sticky compound that they were ready to condemn the use of such a preparation. Compounds of oleic acid were never intended to rub in, and compounds made clear with oleite cannot be applied by friction, as lard ointments or liniments. A thin coating is to be applied lightly. This will be readily absorbed, when another may follow. The minute glands and follicles have not the capacity and will not absorb like a sheep's wool sponge. In the writer's practice, oleite has been used in varying proportions as an addition to any ointment in the Pharmacopœia, and many others, and found an improvement. Some preparations have acquired quite a local reputation.

In a brief report upon the use of oleite as an addition to the ordinary ointment bases, the writer suggested some formulas used by him in his own practice. They are certainly an improvement over ordinary fat bases. The formula suggested was to simply dissolve the drug in oleite, which was to be substituted for an amount equalling from 25 to 33 per cent of the fatty base, then after solution or emulsion the fatty base to be gradually added. Even these do not fulfil the standard sought for in this paper.

* In our reply to query 2,276 (page 39 of last February number), we supposed the terms *oleite*, *solvine*, and *polysolve* to be synonymous and to denote the same substance. Messrs. Lehn & Fink, of New York, subsequently pointed out (p. 99 of last May number) that they controlled the patents for making polysolve. It appears, therefore, that there is a difference, but what this is we are unable to say. This much we may state, however, that we have experimented considerably with polysolve and found it to possess all the remarkable properties claimed for it by its discoverer. Mr. Kilmer states in his paper that his attention was drawn to oleite by Mr. R. W. Johnson, of Johnson & Johnson, N. Y.

THE COLLECTION AND PRESERVATION OF PLANTS.

EVERY one who is interested in natural history knows how useful it is to make collections. As the time during which a plant can be studied in a fresh state is very limited, the necessity of possessing, for such study, working tools and numerous works of difficult carriage makes the herbarium absolutely indispensable to the botanist. With certain care, however, it is possible to succeed in making collections of dried plants which closely resemble these same plants in a fresh state, and which at the same time permit of working at leisure and facilitate comparisons with duly labelled specimens that have undergone the same preparation. On an excursion, the botanist therefore has only to occupy himself with the collection of materials for study which he will utilize upon his return.

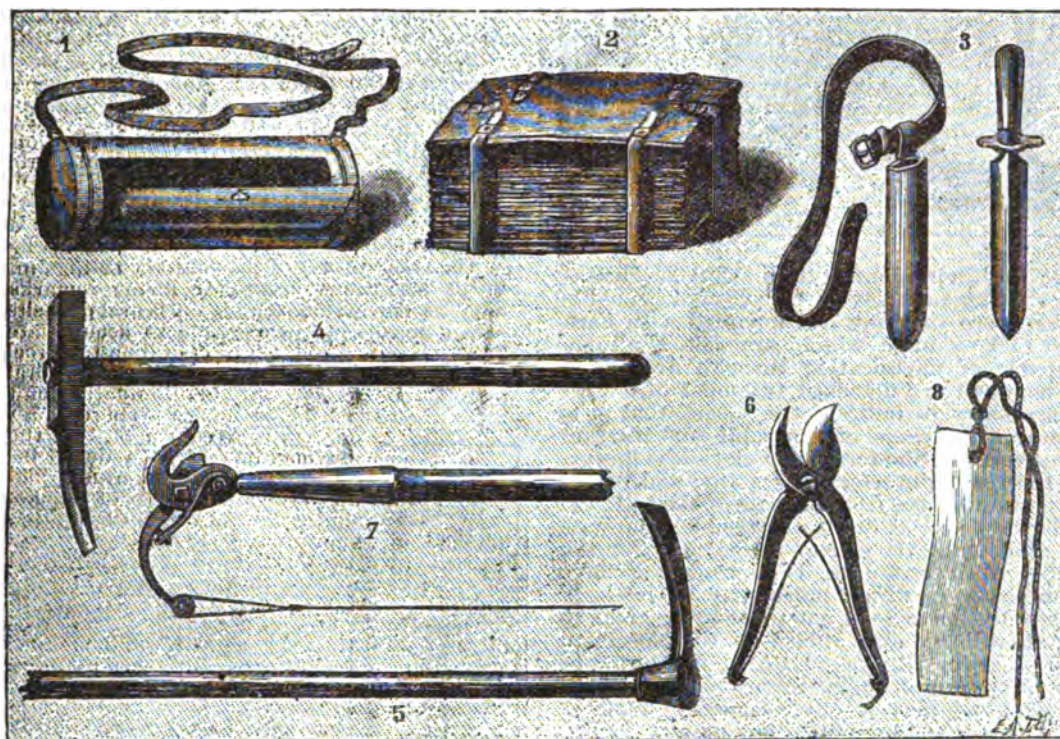
Of course, plants in a dried state no longer possess their natural aspect, but with a little experience a person can easily restore this in his mind, and if, at the moment of collecting, he takes care to note certain characteristics that are necessarily modified through desiccation, it then becomes very easy to re-establish things.

It is of great advantage to the botanist to be able to preserve the plants that he has gathered and named, and this extraordinarily facilitates future work. If he makes a publication, he will be able to show the specimens that are the subject of it, and these types will always permit of rectification by competent persons. It is due to the herbaria formed by travellers that we are gradually coming to be acquainted with the vegetation of the various

excursions that are made every summer under the direction of several botanists. After a few excursions a person will be able to continue them well enough alone. In order to be a botanist, it does not alone suffice to familiarize one's self with the rare plants of the region where he dwells, and it is an error to think that public "herborizations" are made for the sole purpose of making localities known. As regards the study, commonest species have as much importance as others, and it is with these that it is necessary to begin. Therefore it is not necessary to make very lengthy excursions to begin with, and it is by degrees that one should extend the circle of his investigations with the object of finding things that he has not yet studied. It is preferable to collect but a few species at a time, so that they can be the more carefully examined on one's return home, and be properly prepared for the herbarium.

When a person is travelling, the conditions are changed. As one cannot carry his books with him, the wisest thing to do is to collect the largest number of specimens possible, to prepare them well, and to take notes that may be utilized whenever it is possible to do so.

The *Botanical Box or Vasculum* (Fig. 1) is a cylindrical tin box with elliptic ends, and usually painted green. It is provided with a leather strap that permits of its being slung over the back, so as to leave the arms free. It should, as far as possible, be made of the length of the paper that has been adopted for mounting the dried specimens upon. This is a guide in the collection of specimens, which it is then easy to gather of the proper dimensions. When these are too long to go into the box, they are bent at a sharp angle as many times as may be



parts of the world. Our large national museums receive these and hold them at the disposal of botanists, who describe their contents, and who can then draw up floras.

It thus becomes easy to seek, among the vegetable productions of each country, those that we may have an interest in studying. In this respect, horticulture and agriculture are absolutely tributaries of botany; so we should not like to see travellers omit from their labels any details as to the uses of useful plants and as to the processes of culture to which they are submitted. The herbarium is not only useful, but it is a pleasure to consult it. With every specimen there are connected remembrances which years cannot obliterate, and which give it a value so much the greater in proportion as there has been more difficulty in obtaining it.

Says Jean Jacques Rousseau: "All my botanical excursions, the various impressions of the place, the objects that have struck me, the ideas that have occurred to me, the incidents that have mingled therewith, all this has left me impressions which are renewed by the aspect of the plants collected in these same places."

"I shall never more see those beautiful landscapes, those lakes, those groves, those rocks, those mountains, whose aspect has always touched my heart; but now that I can no longer travel to these pleasing countries, I have merely to open my herbarium and I am soon transported thither. The fragments of plants that I gathered there suffice to recall the beautiful spectacle to me. This herbarium to me is a journal of botanical hunts which causes me to begin the latter again with a new charm and produces the effect of a vision that paints them over again to my eyes."

Botanical Excursions.—In order to learn how to collect plants, one will do well to accompany some of the public

necessary, the stem being crushed at the spot where the bend is to be made.

If large collections are to be made, the *vasculum* will have to be of larger size. The usual dimensions are 20 inches in length by 6 in diameter. There are boxes with one or more compartments, but we like the other kind better, as we prefer to have a pocket box in which to put the small plants and delicate things that have to be carefully preserved. The aperture in the box should be large enough to allow the plants to be put in and taken out easily.

Instead of a botanical box, some persons use a temporary press (Fig. 2) to put their gatherings in. This consists of two pieces of strong cardboard or leather, between which are placed sheets of paper that serve to isolate the specimens. The whole is held in place by means of leather straps. This press permits of the easy preservation of species with caducous flowers, such as the anemones, flaxes, certain ranunculaceae, etc. The beginning of the preparation that they undergo permits of having them in a perfect state, while they would have lost a portion of their organs had they been simply put into a botanical box. Unfortunately the press is unwieldy and difficult to carry. Another drawback resides in the use of the numerous straps necessary to hold it together, and which involves a considerable loss of time at each collection.

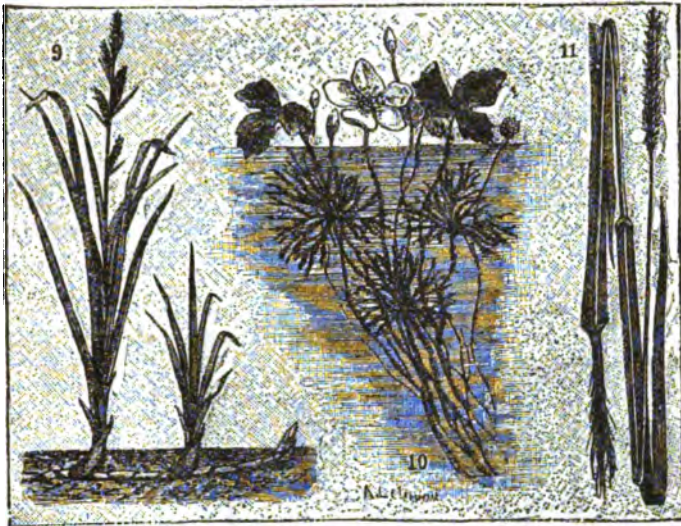
The *Collection Tools* are numerous and varied, each having its merits and defects. For botanizing in sandy places a simple bark knife suffices. It has the advantage of being light and of being easily carried in a sheath that has been devised for it. This apparatus may be replaced by the poignard knife (Fig. 3).

For hard earth, and for plants whose roots penetrate the

earth deeply, these tools are absolutely inadequate, and they should be replaced by the Cosson pick (Fig. 4), which is the apparatus generally adopted. It has the advantage of being very strong and also of being capable of entering the cavities of rocks, owing to the shortness of its handle. But the slight length of the handle renders it difficult to carry this tool, which weighs heavily in the hand. The Decaisne pick (Fig. 5), which certainly is not as strong, is, in this respect, much more convenient, for it may be used as a cane. It can be used also for pulling the branches of trees downward and for pulling in such aquatic plants as grow up a small distance from the edge of the water, etc.

Fig. 6 shows a good pair of shears for collecting branches of trees or shrubs, and spiny plants and those too large to be collected entire, etc. In order to obtain specimens of tall trees, one will be obliged to have recourse to the apparatus shown in Fig. 7.

Collecting Plants.—The plants should be collected as entire as possible, so that they may show all the organs



that can serve for their identification. But specimens, however properly they may have been collected, would be without interest were they not accompanied with carefully prepared tickets upon which are noted all the characters capable of modification through drying, or which cannot be found in a detached fragment of a large plant. It is necessary to indicate the aspect, that is to say, the form and dimensions, of the plant, and whether it is annual or perennial; the form and color of its flowers and its fruit; the station in which it is found (cultivated ground, woods, swamps, etc.); the nature of the soil; the altitude; the locality as accurately as possible; the date of collecting; and finally the uses of the plant. For the bringing together of all these data, it is necessary to have a memorandum book in which notes may be made in measure as the collection is done, a number being given to each plant that will be also affixed to the specimen through strong paper or parchment tags. The latter of these have the advantage of not being injured by humidity. To this effect, use may be advantageously made of tags provided with a string by which they may be firmly attached (Fig. 8).

Plants of small size should be collected entire, along with their roots, which should be detached from the earth with the greatest care (Fig. 9). Where it is a question of parasites, such as the broomrapes, it is necessary at the same time to take up the host plant, the point of adhesion of the roots being sought for, so as to have the character of the parasitism in as evident a manner as possible. After freeing the roots of the earth by gently shaking them, the plants are ticketed and placed in the vasculum.

With the larger species, such as shrubs and trees, it is necessary to confine one's self to the gathering of either a summit or a branch provided with leaves, and with flowers or fruit. In this case it is necessary to gather carefully all the parts of the plant that exhibit differences, so that the whole shall recall as perfectly as possible the plant whence it is derived. With herbaceous species should be gathered a few of the radical or basal leaves, which often differ notably from those of the higher parts of the stalk. From trees and shrubs, a piece of the trunk or bark should be taken, and, in addition, the flower and fruit bearing branches, and branches of the first year, upon which the leaves are often more greatly developed.

Certain plants are monœcious, that is to say, the same plant bears distinct male and female flowers. This occurs in the Indian corn, hazelnut, etc. Others are diœcious, the male and female flowers being borne on different plants. Such is the case with the date tree, the willows, etc. Here an endeavor should be made to find specimens showing the two sexes. Some plants flower before their leaves are developed. In this case, it is necessary to collect the flowers and return later to get the leaves. The hazelnut, the willows, the colt's foot, the colchicum, etc., are examples of such plants. With the willows, it is

sometimes necessary to make even three gatherings, one of the flowers, one of the fruit and leaves when beginning to develop, and a third, of the mature leaves; and, as in this case it is easy to make a mistake and gather from another plant such specimens as are needed to complete those that one already has, we cannot too strongly recommend the marking of the trees that are to be visited in the future, either by removing a piece of the bark, or, better, by means of a wire passed around the trunk. Certain species lose their leaves at the moment of flowering. It is necessary to gather these in their various states of development.

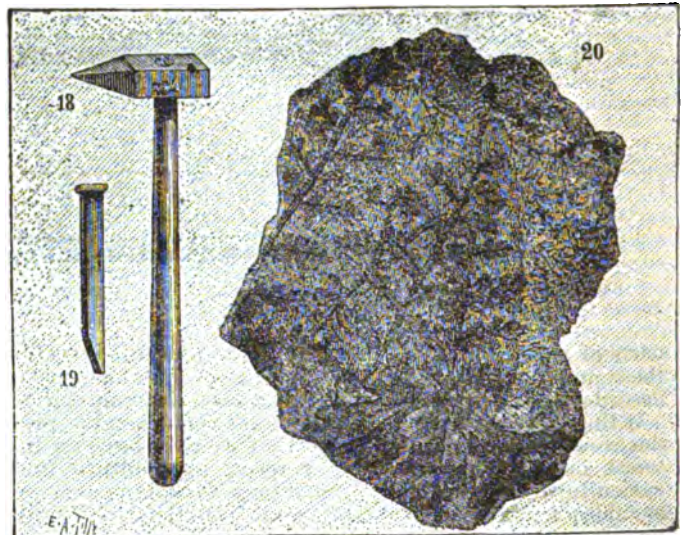
Such plants as have flowers whose petals easily drop off, such as certain anemones, the flaxes, the aquatic ranunculuses (Fig. 10), etc., should be placed in a portable press; this is the only means of preserving them intact. When it is impossible to do otherwise than put them into the vasculum, it is necessary to select specimens provided with buds, which will be allowed to expand at home and then be put in the press. Specimens of climbing and other plants that are necessarily of large size should be bent at a sharp angle in order to bring them to the dimensions of the vasculum, and so that they shall occupy the least space possible (Fig. 11).

With palms, tree ferns, pandanus, and other large plants, it will suffice to take a section of the trunk, and an entire leaf, which, if too large, may be divided into several segments, each numbered so that all may be the more easily united again later on. Large inflorescences are divided like the leaves; both may also be gathered entire, and then be dried by wrapping them in paper of large size in order to preserve them just as they are.

Fruits are to be gathered in as complete a state of maturity as possible. When they are large and fleshy, they should be put into alcohol on one's return from the excursion. For the small sorts, that are liable to be crushed in the box, it is well to have a small bottle full of alcohol to put them in immediately after they have been provided with parchment tags on which is written in lead pencil the number of the note book in which they are referred to.

We particularly insist upon the point that all the parts of the same plant should be ticketed in such a way that they may be united later on, and, to this effect, the simplest thing to do is to give them the same number.

The ferns (Figs. 12, 13, and 14), the lycopods, the rhizocarps, and the equisetæ (Fig. 15) are collected in the same way as the phanerogams. The one thing essential is to select specimens provided with organs of reproduction. These latter are not always observed at first sight, yet they possess great importance in the distinguishing of species.



The mosses (Fig. 18), the liverworts, and the lichens are easily collected. They, too, should show the organs of reproduction. As regards the small terrestrial species, these should be taken up in a mass, a thin layer of earth being preserved to bind the whole together. The species that grow upon trees should be collected by removing the bark on which they exist. Finally, as regards the saxicolous, lichens, and liverworts, it will be necessary to break off a fragment of the rock upon which they grow (Fig. 17).

Fungi that have rather a dry consistency, such as the polyporei, clavarias, sphaerias, etc., are easily collected, and the same is the case with such as live as parasites upon plants, and belong to the families Cœomacei, Mucedines, etc., it being merely necessary to select a fragment of the plant upon which they grow. As regards fleshy species, special care is required. They would quickly spoil if they were in contact with each other in the vasculum, and so before placing them therein it is indispensable to wrap them in paper or to put them in bags, so as to isolate them well.

The charas are gathered in the same way that the

aquatic phanerogams, or rather the seaweeds, are. As the object of this article is rather to make known the precautions to be taken in the collecting and preparing of phanerogams, those who desire to study seaweeds especially will find all the information desirable in the excellent pamphlet published by Dr. Bornet, member of the Institute.*

Marine algæ should, as far as possible, be collected upon the rocks. Those thrown on the shore by the waves should not be preserved unless they are very fresh, and have not long been exposed to the air and to the rain, which deteriorates them. If they cannot be prepared at once, it is easy to preserve them by putting them into some vessel or other and sprinkling them with salt.

Drawings and photographs render collections of dried plants complete. A sketch, as bad as it may be, made in the note book, may have great value as giving an idea of the aspect of a tree, for example. Documents of this kind are generally wanting, and so we are almost always ignorant of the aspect of tropical trees.

The collecting of fossil plants should not be neglected. The study of these is assuming proportions that show the importance that they may have in the classification of species now living, and in the history of plants through the ages.

It will be necessary, therefore, to explore such quarries as may contain these fossils. By means of a strong pick, the collector may pull out the blocks of stone, from which, with a geological hammer (Fig. 18) and a cold chisel (Fig. 19), he will detach the parts to be preserved, and

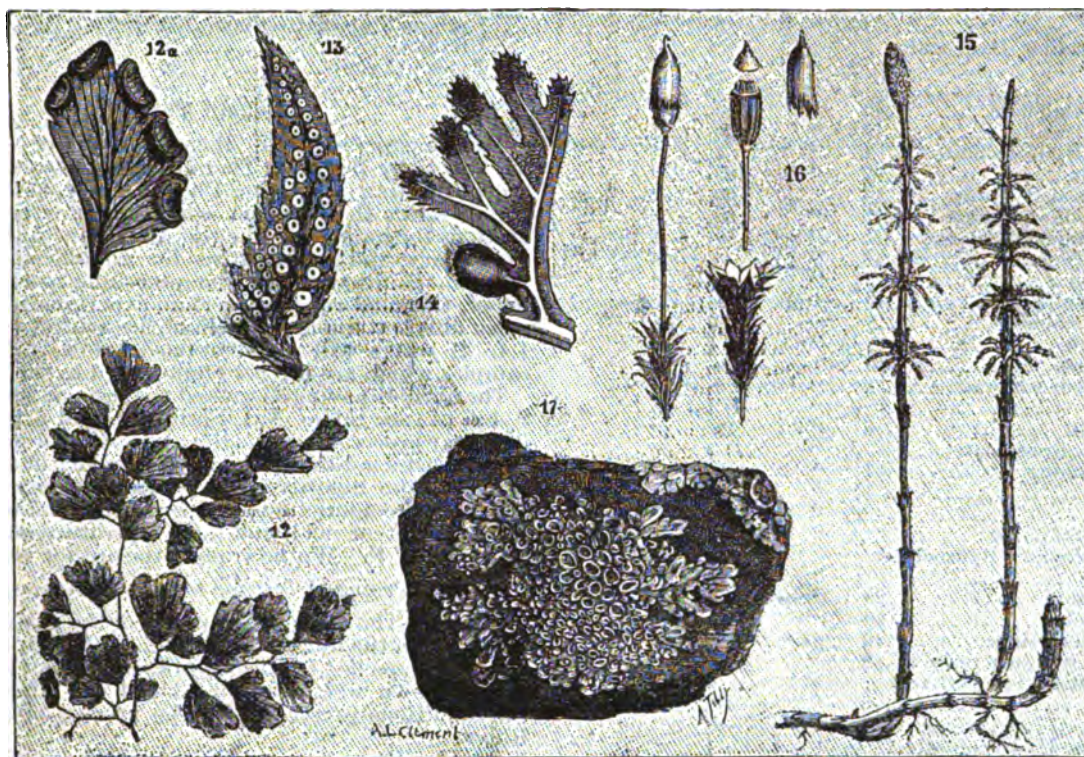
Naphthol-Camphor and Salol-Camphor.

THE valuable properties of the compounds of camphor with carbolic acid and with salol form the subject of a communication by M. Désesquelle (*Répertoire*, May 10th, p. 200). In hospital use they have been found to possess considerable antiseptic properties, and the application of the naphthol-camphor is not followed by pain, in consequence of the anæsthetic action of the camphor. In preparing them, M. Désesquelle finds the most convenient proportions to be 200 parts of camphor to 100 parts of beta-naphthol or 300 parts of salol. The two ingredients are reduced together to a fine powder and then gently warmed until liquefaction is complete; the liquid is then filtered and preserved in a well-closed bottle. The liquids obtained are denser than water, in which they are insoluble, and miscible with fixed and volatile oils, ether, and alcohol. They also possess considerable solvent powers, 10 parts of iodine, for instance, being soluble in the cold in 90 parts of naphthol-camphor. Cocaine hydrochlorate and the cinchona alkaloids also dissolve in them in considerable proportions.

Lastly, the liquids are said to constitute an excellent medium for keeping surgical instruments, as they attack neither the metal nor the wood.—*Pharm. Journ.*

Sublimate Antiseptic Paper.

At a session of the International Congress of Therapeutics, Materia Medica, and Pharmacology, recently held at



these he will render thin in order to make them more transportable (Fig. 20). Specimens thus prepared will have to be carefully wrapped up in paper and put into a geological bag (which then replaces the vasculum), in such a way that the surfaces that bear impressions shall be prevented from being injured by friction.—D. Bois in *La Nature* (after *Scientific American Supplement*).

(To be continued.)

The Behavior of Certain Animals toward Saccharin.

BERTHELOT found that certain animals, such as dogs, cats, and wasps, do not eat anything containing saccharin; and Liebreich has ascertained that bees and dogs can distinguish, with unerring certainty, between articles of food containing saccharin or free from it. A. Stiff has gone over the same ground, and finds these facts to be as stated. Two dogs, to whom a little saccharin was offered on a finger, could not be induced to lick it either by coaxing or by threats. On pouring down their throats some water which had been sweetened with saccharin, they threw it up immediately. Three cats, who were in the habit of being fed only once a day, were given their food mixed with a very small quantity of saccharin. They refused to touch it, although they were decidedly hungry. After a few hours, the same cats were offered some food free from saccharin. This they finally ate, after having smelled it for some time, evidently with suspicion.—*Chem. Centralbl.*

Paris, M. Balme presented his sublimate antiseptic paper and the apparatus for its preparation. The paper is white filtering paper, in little oblong squares, easily separated from the sheet by being perforated like postage stamps. Twenty such form a little book, easily carried in the vest pocket. But the interesting feature is the mode of preparation. A solution of mercuric chloride and sodium chloride is made so as to contain to every thousand cubic centimeters a known quantity of corrosive sublimate. Some of the liquor is introduced into a dropper, so constructed as to deliver slowly drops measuring exactly one-twentieth of a cubic centimeter. The ready perforated paper is spread on little trays, where it rests on glass rods, and five drops of the solution are allowed to fall on each division of the paper sheet. Any convenient number of trays may thus be successively charged at one operation, after which the paper is dried and may be used for all antiseptic purposes. The advantage of this procedure is that each square contains exactly a known quantity of sublimate, and that the operator never touches the solution or the wet paper with his hands. Besides, the proportion of liquid is calculated in such a way as to just moisten the paper without even wetting the glass rods.

During the discussion which ensued, M. Vigier remarked that paper offers over cotton wadding a great advantage, in that, while sublimate becomes after a time insoluble when applied to wadding, this is never the case with paper. The reason has not been ascertained, but the fact is unquestionable. Dr. Hédouin, of the military service, added that he thoroughly approved of the antiseptic paper; it was substantially his idea, only improved in some details, and he thought it especially convenient for military purposes.—*Chem. and Drugg.*

* Instructions pour la récolte et la préparation des Algues. Cherbourg, 1886.

Maximum Doses (for Adults) of the Newer Remedies.

THE following list of average maximum single and daily doses of the new remedies introduced during the last decade or so is based partly on a compilation published in the *Pharm. Centralhalle* (1889, No. 26), partly on *Merck's Bulletin* (1889, June), and partly on notes of our own.

	Largest Adult Dose, by Mouth, in			Grains.	
	Single.	Daily.		Single.	Daily.
Acid, Cubebic.....	15 gr.	75 gr.			
" Iodic.....	5 "	18 "			
" Osmic.....	1/2 "	3/4 "			
" Picric.....	8 "	24 "			
" Pyrogallie.....	1 "	5 "			
Aconitine, cryst. (Duquesnel).....	1/100 "	1/100 "			
Aconitine, Germ. (Geiger and Hesse).....	1/100 "	1/100 "			
Aconitine Nitrate (French).....	1/100 "	1/100 "			
Adonidin.....	1/100 "	1/100 "			
Agaricin.....	1/2 "	1/2 "			
Allyl Tribromide.....	8 drops	—			
Aloin.....	4 1/2 gr.	9 gr.			
Amylene Hydrate.....	60 "	120 "			
Anemonin.....	1/2 "	1 1/2 "			
Aniline Sulphate.....	1 1/2 "	5 "			
Antifebrin (Acetanilide).....	15 "	60 "			
Antipyrine.....	30 "	120 "			
Apiol, cryst. (solid Parsley-Camphor).....	15 "	60 "			
Apocodeine.....	1/2 "	1 1/2 "			
Apomorphine Hydrochlorate.....	1/2 "	1/2 "			
Arbutin.....	15 "	60 "			
Arsenic Bromide.....	1/2 "	—			
" Iodide.....	1/2 "	—			
Asparagin.....	1 1/2 "	5 "			
Aspidospermine Hydrochlorate.....	1/100 "	1/100 "			
Baptisin.....	1/2 "	1 1/2 "			
Bebeerine Sulphate.....	45 "	150 "			
Benzene (Benzol).....	15 "	90 "			
Berberine Hydrochlorate.....	1 "	4 "			
Boldoglucin.....	60 "	180 "			
Butyl-Chloral Hydrate.....	15 "	60 "			
Caffeine Sodio-Benzozate.....	15 "	60 "			
" Sodio-Salicylate.....	15 "	60 "			
Cannabin Tannate.....	15 "	30 "			
Cannabinon.....	1 1/2 "	4 1/2 "			
Carbon Bisulphide.....	10 drops	40 drops			
" Trichloride.....	8 gr.	30 gr.			
Chrysarobin.....	1/100 "	1/2 "			
Chloralamide.....	30 "	160 "			
Cocaine Hydrochlorate.....	2 "	8 "			
Colchicine.....	1/4 "	1/2 "			
Colocyntin.....	6 "	12 "			
Coniine Hydrobromate.....	1/100 "	1/2 "			
Convallamarin.....	1 "	5 "			
Cotoin.....	1 1/2 "	8 "			
Daturine.....	1/4 "	1/2 "			
Duboisine Sulphate.....	1/4 "	1/2 "			
Erythrophloeine Hydrochlorate.....	1/2 "	1/2 "			
Ethyl Bromide.....	20 drops	—			
" Iodide.....	20 "	—			
Ethyl-oxy-Caffeine.....	10 gr.	30 gr.			
Euonymin (the pure resinoid).....	8 "	16 "			
Exalgin (Methyl-phenyl-acetamide).....	6 "	12 "			
Fuchsin.....	4 "	8 "			
Gelseminine Hydrochlorate.....	1/100 "	1/2 "			
Guajacol.....	1 1/2 "	8 "			
Helenin (solid Elecampane Camphor).....	5 "	15 "			
Helleborein.....	1/2 "	2 "			
Homatropine salts.....	1/2 "	4 "			
Hydracetin (Acetyl-phenylhydrazin; see Pyrodin).....	1 1/2 "	3 "			
Hydrastine Hydrochlorate.....	2 "	8 "			
Hydroquinone (Hydrochinon).....	12 "	24 "			
Hyoscine Hydrochlorate.....	1/4 "	1/2 "			
Hyoscyamine Sulphate.....	1/4 "	1/2 "			
Hypnone (Aceto-phenone).....	8 "	24 "			
Ichthyol.....	15 "	60 "			
Iodine Trichloride.....	1/2 "	1 1/2 "			
Iodole.....	8 "	15 "			
Iridin.....	3 "	8 "			
Kairine.....	15 "	60 "			
Menthol.....	15 "	75 "			
Mercury-Thymol Acetate.....	1/2 "	2 "			
Mercury Bichloride, peptonized.....	1/2 "	1 1/2 "			
Mercury Cyanide.....	1/2 "	1 1/2 "			
" Formamidated.....	1/2 "	1 1/2 "			
" Salicylate.....	1/2 "	1 1/2 "			
" Tannate.....	1/2 "	1 1/2 "			
Methacetin (Acet-para-anisidin).....	3 "	6 1/2 "			
Methylol.....	60 "	120 "			
Naphthalene (Naphthalin).....	15 "	60 "			
Naphthol, beta.....	15 "	60 "			
Nickel Bromide.....	8 "	24 "			
Nitroglycerin (Glonoin).....	1/4 "	1/2 "			
Paraldehyd.....	60 "	—			
Parthenicine.....	8 "	15 "			
Pelletierine, salts.....	8 "	75 "			
Pereirine Hydrochlorate.....	8 "	30 "			

* According to Merck and the Pharm. Centralhalle. But other authorities give a very much smaller dose.

Largest Adult Dose, by Mouth, in
Single. Grains. Daily.

Phenacetin (Para-acet-phenetidin).....	15 gr.	30 gr.
Picrotoxin.....	1/100 "	1/2 "
Piperin.....	9 "	18 "
Podophyllotoxin.....	1/2 "	1 "
Potassium Osmate.....	1/2 "	1/2 "
Propylamine (so-called; see Trimethylamine).....	—	—
Pyridine.....	—	25 drops
Pyrodine (name of an impure (?) form of Hydracetin; see this).....	1/2 "	1 1/2 gr.
Quinoline (Chinoline) Tartrate.....	30 "	90 "
Resorcin.....	45 "	150 "
Salicin.....	30 "	150 "
Salol.....	30 "	150 "
Silver Cyanide.....	1/100 "	1/2 "
" Iodide.....	1/100 "	1/2 "
Solanine.....	1 1/2 "	8 "
Sparteine Sulphate.....	1/2 "	1 1/2 "
Strophanthin.....	1/100 "	1/2 "
Sulphonal.....	60 "	120 "
Terpin Hydrate.....	5 "	15 "
Terpinol.....	5 "	15 "
Thalline Sulphate.....	8 "	24 "
" Tartrate.....	8 "	24 "
Thiol (artificial Ichthyol).....	2 "	5 "
Tincture of Strophanthus (1 in 20).....	5 min.	30 min.
Tribromallyl.....	10 gr.	—
Trimethylamine (miscalled Propylamine; 10% solution).....	45 "	150 gr.
Uralium (Chloral-Urethane).....	30 "	—
Urethane.....	75 "	—
Xylene (Xylol).....	30 "	—

Pepsin Tests.

FROM a paper entitled "Relative Value of Various Pepsin Tests," by Mr. F. A. Thompson, of Detroit, read at the recent meeting of the Am. Pharm. Assoc. at San Francisco, we select that portion which contains practical suggestions for improving the test of pepsin in the National Formulary, and propositions for an official test in the next U. S. Pharm. In the preceding portions of the paper, the author records certain experiments made upon seven different kinds of pepsin of the market. The figures 1 to 7, which will be mentioned below, refer to these samples, which are further enumerated in the table.

The author, having discussed the tests of the present U. S. Ph. (A; see table), Nat. Form. (B), and British Pharm. (C), next proceeds to a modification of the test of the U. S. Ph. (D), which differs from the latter only in the quantity of acid in the digestive fluid, which is 0.3 per cent of absolute hydrochloric acid, while the official test contains 0.47 per cent of acid, and the temperature used was constant at 104° F. We now quote the author verbatim:

(E) Proposed Test for the U. S. Pharm., 1890.

Pepsin.—The digestive principle of the gastric juice obtained from the mucous membrane of the stomach of the hog, and capable of *completely dissolving* not less than 500 times its own weight of hard-boiled egg albumen, under the conditions prescribed by the process of assay given below.

Assay.—Prepare an acidulated water containing 0.2 per cent absolute hydrochloric acid, by mixing 5.5 C.c. (or 6.38 Gm.) of hydrochloric acid (sp. grav. 1.16, and containing 31.9 HCl) with 994.5 C.c. of distilled water. Boil two or three eggs for fifteen minutes; when cold cut into two pieces; separate the whites; carefully remove all superficial moisture, and by the aid of a stiff spatula press through a No. 30 brass sieve. Measure out 100 C.c. of the acidulated water and place 10 Gm. of the finely divided egg albumen in a medium-sized mortar, triturate with a portion of the acid fluid added gradually until of a uniform mixture, then transfer to the flask or container, and with the remaining fluid insure the removal of all particles of the albumen, avoiding any loss of the fluid. Repeat this operation for each container, and then place them in a water-bath provided with a suitable apparatus for maintaining a constant temperature. When the digestive fluid has reached 98.5° F. (37° C.), add the following amounts of the pepsin under examination [to the several flasks lettered as follows]:

(A) 0.035 Gm., (B) 0.025 Gm., (C) 0.020 Gm., (D) 0.015 Gm.

and after digesting three hours at this temperature remove the containers, fill with cold water, and place in cold (running) water. After one-half hour or longer there should not be deposited more than a few particles in container C, and if more than this is in B the pepsin is below the standard requirement.

To determine more closely the actual dissolving power of the pepsin, repeat the operation, using amounts of pepsin nearer the proportion found necessary for complete solution of the albumen by the preliminary assay, reading the results in a similar manner.

In devising this test, it is with the intention of giving one which bears some relation to the conditions maintained in natural digestion. While we all know it is im-

possible to imitate exactly the physiological process governing digestion, I think we can work, however, with a temperature nearer to that of the body, use the same quantity of acid found present in the stomach, and also digest about the average length of time that the food remains in a normal stomach, rather than disregard all the natural conditions by using the maximum temperature (180° F.) and an abnormal quantity of acid. The proportion of albumen and water used must necessarily be an arbitrary one. A dilute solution, i.e., 1 : 10, would seem to be much more satisfactory, as representing a natural digestion, than a concentrated one, which would give a stronger solution of the products—acid albumen and peptone formed—which would have an increased retarding action on the dissolving power of the pepsin. In the natural digestion these products, which are undoubtedly produced in minimum quantities in the stomach, are rapidly eliminated, and thus exert no retarding influence on the proteolytic action of this digestive ferment, pepsin.

If the National Formulary requirement for pepsin is understood to be a complete solution of 500 times its own weight of egg albumen, then the standard of digestive strength has been increased to 13 times stronger than the U. S. P. requirement for saccharated, equivalent to 25 times stronger based on the modified official test. That is, a gramme of pepsin capable of completely dissolving 500 Gm. of albumen by the conditions of the National Formulary test, is capable of completely dissolving nearly 650 Gm. by the official, and 1,250 by the modified official. We have in sample No. 1, possessing the highest digestive power of any examined, a product one and three-fifth times stronger than the above National Formulary requirement, and without doubt as strong a product as would seem advisable to dispense until more is known regarding the ac-

If the pepsin were capable of doing this, it would almost completely dissolve 2,000 times its own weight of coagulated albumen, or four times the amount required. Then it further states that if more than a few particles remain in the fourth flask, the pepsin should be rejected as being below the requisite standard. This would seem to indicate that if the pepsin was not capable of (nearly) completely dissolving 500 times its weight of albumen, it should be rejected, while, on the other hand, if it leaves only a few particles, it states in the actual assay that you shall use such a proportion of egg albumen that about one-quarter of it will remain undissolved at the close of the experiment. These statements will not appear to be discordant to the inexperienced operator, while they would to one more familiar with the subject. When any pepsin is allowed to act upon more albumen than it can dissolve in a given time, the actual amount dissolved is much increased; in fact, three times larger than if it were required to dissolve completely the quantity taken. This is illustrated in comparing columns B and F of the recapitulation table. If the National Formulary requirement were complete solution of the 500 times its own weight of albumen, or the amount originally taken—and I am convinced that complete solution is the best method of reading results—then the various pepsins examined have the following activity, the table below indicating the amount of albumen completely dissolved by one Gm. of each brand:

No. 1	dissolved completely	800 Gm.
" 2	"	350 "
" 3	"	350 "
" 4	"	350 "
" 5	"	300 "
" 6	"	200 "
" 7	"	75 "

RECAPITULATION OF THE RESULTS OBTAINED BY THE VARIOUS TESTS.

QUANTITY OF COAGULATED EGG ALBUMEN DISSOLVED BY ONE GRAMME OF EACH BRAND.

	A	B	C	D	E	F	
	PHYSICAL PROPERTIES.	U. S. Pharmacopoeia, 1880.	National Formulary, 1888.	British Pharmacopoeia, 1885.	Modified U. S. P., 1880.	Author's proposed test for U. S. P., 1880.	National Formulary modified, i.e., complete solution.
1	Soluble, semi-transparent scales, free from objectionable odor and taste.	1,200	2,500	175	2,000	600	800
2	Opaque amber scales, putrefactive odor and quite insoluble.	550	1,000	100	1,000	300	350
3	A light gray, largely soluble powder, and free from objectionable odor or taste.	550	1,000	100	1,000	300	350
4	A light yellow powder, free from objectionable odor and largely insoluble.	550	1,000	100	1,000	300	350
5	Yellow scales, strong putrefactive odor and exceedingly hygroscopic.	400	1,000	60	900	250	300
6	Gray powder, largely insoluble and odorless.	250	650	50	700	150	200
7	Amber scales, soluble, free from bad odor and very hygroscopic.	100	300	20	250	50	75

tion of this ferment. While pepsin has not been isolated as a known pure substance as yet, it would seem as if we were approaching such a product, as I have examined several samples submitted by the manufacturers of product No. 1, and found them to be two or three times stronger in digestive power, or capable of completely dissolving from 1,500 to 2,000 times their own weight of albumen by the National Formulary test, and 4,000 to 5,000 by the modified official. At present a pepsin of this extremely high digestive power would hardly seem convenient for dispensing, requiring to be administered in inconveniently small doses; otherwise it might produce (unknown) untoward effects as a result of its extreme activity.

According to the conditions of the proposed test the following results were obtained, indicating the comparative and actual dissolving power of one Gm. of each pepsin:

No. 1	dissolved completely	600 Gm.
" 2	"	300 "
" 3	"	300 "
" 4	"	300 "
" 5	"	250 "
" 6	"	150 "
" 7	"	50 "

(F) National Formulary Test, Modified.

In reviewing the National Formulary test, I find that the preliminary assay states that if the pepsin be of a good quality, not more than a few undissolved flakes should remain in any but the first flask.

Chloralamide: a New Hypnotic.

A NEW hypnotic is announced, under the name *chloralamide*, which is in form of colorless crystals, soluble in 9 parts of water and in 1½ parts of 96 per cent alcohol. It has a mild, faintly bitter taste, without caustic effect.

Chloralamide is not altered by weak acids. By caustic alkalies, however, it is rapidly decomposed. Alkali carbonates and bicarbonates produce this effect but very slowly.

For this reason, chloralamide cannot be administered in alkaline solution. It is best given in powder, or in aqueous or alcoholic solution, which may be slightly acidulated.

Solution of nitrate of silver does not affect either the aqueous or the alcoholic solution of the substance.

The dose is up to 60 grains for adults. It produces sleep within about half an hour, the latter lasting 7 to 9 hours. It has no material effect upon the circulation.

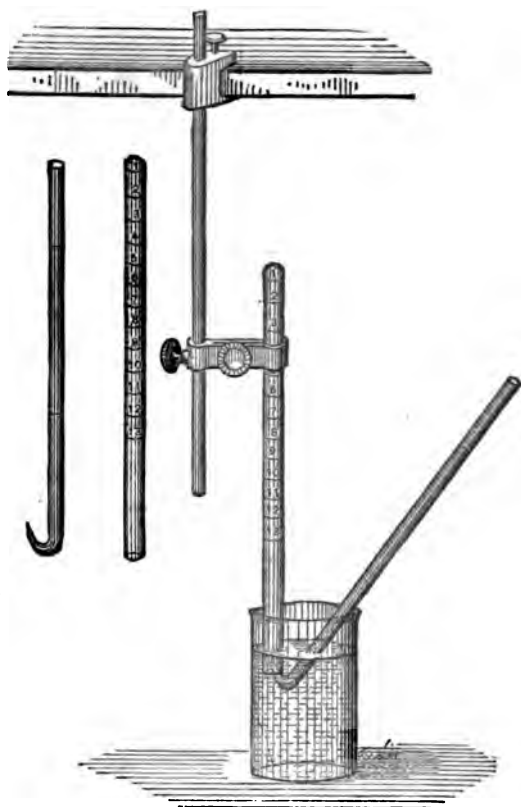
This new remedy has been introduced by Prof. Mering, of Strassburg. According to experiments thus far made, it is indicated in cases of insomnia from simple nervous irritability, in neurasthenia, phthisis, cardiac defects, etc., and generally in insomnia unaccompanied by much pain. The "Chemische Fabrik auf Aktien (vorm. E. Schering)" of Berlin are engaged in its manufacture. The price will be about treble that of chloral.

Regarding the chemistry of the new remedy, we have to await further information.

A SIMPLE UREAMETER.*

BY PROF. L. E. SAYRE.

It is, perhaps, conceded by the pharmacist generally that that part of chemical analysis involved in the examination of urine is a branch of chemistry which comes very properly within the lines of professional work of the pharmacist. It may be urged that the physician is quite competent to make all the examinations necessary of this kind; the majority of young men now graduating at our medical colleges being well equipped for accurate urinary analysis. While this is true, physicians in active practice who are convenient to a pharmacist will not always take the time nor give the patience to making repeated, careful analyses such as are demanded in some classes of disease. I was impressed with this fact some time ago, while visiting in one of our large cities. A physician wanted a quantitative determination of samples of urine; he was able to do the work himself, but was one of the class I have described. It fell to my lot to accommodate him, as the pharmacist (my friend) to whom he applied did not feel himself competent to perform the work. This incident forcibly brought to my mind the importance of the pharmacist's being fully equipped for chemical work of this sort. He has the time, and the busy practitioner has not, and such chemical service as this, rendered to the physician or the patient, is sometimes of pecuniary benefit to the pharmacist.



Sayre's Ureameter.

In the college laboratory the pharmaceutical student of to-day receives a more or less thorough course of instruction in this branch of chemistry, which shows a recognition of this matter on the part of the pharmaceutical institutions of instruction.

In the instruction of the student in urinary analysis, it is especially desirable that he be educated to use the simplest forms of apparatus and to make these simple forms to have as wide a range of application as possible. It is the attempt to carry out this principle last winter in this class of work that suggests the present article. It became necessary to extemporize some home-made instrument for the use of each individual member of the class, to be used as a ureameter. With but a few suggestions on my part, the students made the following: A piece of soft glass tubing 10 inches long, and $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter, was provided. Over the Bunsen burner one end was carefully rounded and closed, making a sort of long and narrow test tube. This was covered with a thin film of melted wax and graduated into cubic centimeters by pouring into the tube metallic mercury, 1 C.c. at a time, and marking with a fine point each C.c. on the glass through the wax film. The tube thus graduated was etched in the fumes of hydrofluoric acid in the following manner: A piece of lead pipe was closed at one end; at the opposite, open end, a cork was provided, through which a hole was cut, just large enough to admit and suspend the glass tube. Fluorspar and sulphuric acid were introduced into the pipe, and the suspended glass tube was placed in position. After an exposure of a short time the etching was

complete, and a sort of Bunsen eudiometer was made, which served admirably as a ureameter.*

In using the tube, it is first filled with a solution of hypochlorite of sodium and inverted into a beaker partly filled with the same liquid, held in position by a clamp as represented. One C.c. of the urine is introduced into the tube by means of a curved pipette, also shown in the figure. The pipette consists of a glass tube $\frac{1}{4}$ inch in diameter and 8 to 10 inches in length, drawn out to a fine point and curved at the pointed end, at such an angle that it can readily be inserted up a little distance into the inverted eudiometer. The straight arm of the pipette is graduated so that between two marks, made with a file, it measures 1 C.c.

This simple instrument has so pleased me in the accurate results which it gave, and in the drill and independence it gave the students, that I have made it the basis of a paper to be read among our San Francisco friends. The students realized that they could be independent of the more elaborate instruments which are being figured from time to time in the journals, and the results obtained were always more satisfactory than those obtained from the use of the Prof. Doremus ureameter, which appears to be the more commonly employed. The objection to the latter I have found to be that in the hands of the students it does not furnish accurate results, because so much of the gas is allowed to escape at the open end. I have had the students compare their own with the Doremus instrument, using a solution of urea of known strength for the purpose. As a result they report that the eudiometer always shows more exactly the quantity of urea, gives more nearly the theoretical quantity of gas, than the ureameter of Dr. Doremus. I may add that this has been my own experience as well.

I have no doubt that this simple and inexpensive piece of apparatus has suggested itself to others, but there may be some of the craft who may not have had occasion to think of it, and may appreciate this reference to it.

Antipyrine Incompatibles.

A SHORT time since, M. Carles drew attention to a precipitate which is formed by mixing solutions of antipyrine and extract of cinchona. M. Ollivier, who has been making further experiments, says (*Bull. Comm.*, June, p. 278) that all the active principles are precipitated together, and that there remain in the liquid hardly perceptible traces of alkaloids or antipyrine. According to M. Carles, however, the precipitate is readily soluble in weak acids, so that it might dissolve in the gastric juice, and the mixture, though unsightly, might not be inert. Another apparent incompatibility has been recorded by M. Blainville (l. c.), who, having occasion to mix 4 Gm. of antipyrine and 5 Gm. of chloral hydrate in 15 Gm. of water, observed that the mixture assumed a milky appearance, and upon clearing deposited an oleaginous liquid. After decantation, this liquid soon crystallized, and then no longer possessed the taste of antipyrine or chloral, but a flavor rather resembling that of coriander seeds. Attention is called to the inconvenience that may result from the prescribing of complex substances that may change their physiological action altogether, and it is recommended that as far as possible, when ordering them, simple formulæ in which only distilled water and a simple flavoring agent enter should be adopted.—*Pharm. Journ.*

Castor Oil Chocolate.

GIRAUD proposes to facilitate the administration of castor oil by incorporating it with cacao. For this purpose he takes finely-powdered cacao, deprived of oil, such as it is found in commerce. With this he incorporates the castor oil, and adds a sufficient quantity of vanilla to flavor it. Next he adds sugar, and grinds the whole upon a heated slab. Finally he transfers the mass into moulds, and allows it to become cold.

He recommends the following proportions:

Cacao, freed from oil and powdered.....	50 parts
Sugar, in powder.....	100 "
Castor Oil.....	50 "
Vanilla, in powder.....	q. s.

[The size of the moulds may be chosen so that it will require from three to six of these "chocolate drops" to form a dose for an infant.]—After *Rép. d. Pharm.*

Dentifrice.

A. GAWALOWSKI recommends as a very efficient dentifrice, which is at the same time innocuous to the enamel of the teeth, the following:

Cuttle-fish Bone, powd.,	
Peroxide of Hydrogen, 4%	50 q. s.

Mix the cuttle-fish bone with the peroxide to a stiff paste, and use this for brushing and rubbing the teeth. The latter will gradually become bleached.—*Zeit. Oest. Ap. Ver.*

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

* It will suggest itself to any one, perhaps, that a long, narrow test tube, graduated on paper, will answer for extemporaneous ureameter. L. E. S.

APPARATUS FOR BOILING WITH REFLUX CONDENSER, AND DISTILLING WITHOUT ALTERING THE POSITION OF THE CONDENSER.

It is frequently required to first boil a liquid with an inverted condenser, and then to distil off some portion or the whole of the contents of the flask. The moving of the condenser to perform the second operation after the first has been completed is always somewhat inconvenient, and in order to avoid this I have devised the following arrangement:

The condenser is fixed perpendicularly, as in the accompanying drawing. The lower end of the inner tube has a wide mouth, into which is inserted an india-rubber stopper. The distilling flask is placed at the side (on the water-bath or tripod stand). Into the stopper of the latter pass two glass tubes. One of these, C, is bent obliquely towards the condenser, and passes through the centre of the india-rubber stopper of the condenser tube, and as far as the centre of the same. The other tube, A, which is bent parallel to C, is divided at the point D. It reaches only just to the upper surface of the condenser stopper. The junction at the point D is (in the case of boiling with reflux condenser) made by means of a piece of thick-walled india-rubber tube. If now the liquid in the flask be made to boil, the vapor passes away up both the glass tubes into the condenser. By the one, C, it passes direct to the centre of the condenser, and the condensed liquid runs down towards the other tube. Vapor from the boiling liquid comes also into the condenser by means of the other tube, A, but this tube acts in addition as a carrier of the condensed liquid back into the flask again.

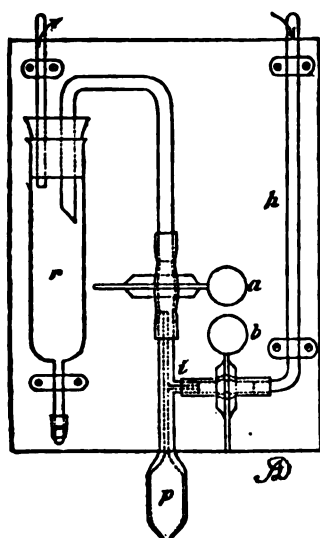
When it is required to distil off any portion of the liquid in the flask, it is merely necessary to disconnect

is opened, whereupon the liquid in the pipette and lateral branch will flow off, while the column in the stem just above *i* will always remain uniformly behind. It is only necessary to select such pipettes, or to construct them on purpose, as will deliver each time exactly the required volume.—*Chem. Zeit.*

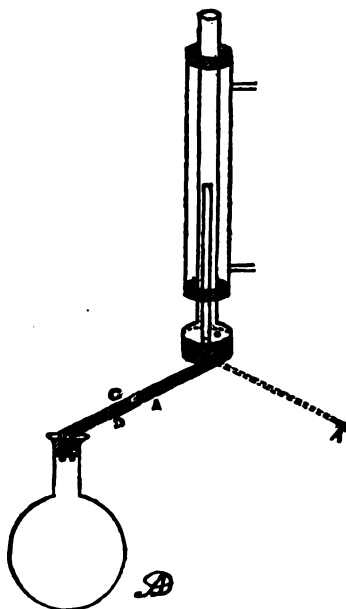
A NEW BALANCE OF PRECISION.

In the balance here illustrated, which has been patented by A. Rueprecht, of Vienna (25 Favoritenstrasse), it is intended that the coarser weighing, down to 1 Gm., be done while the case is open, but that all the finer weighing be performed with closed case, and in such a manner that all handling of the small weights is rendered unnecessary. We shall not give a detailed technical description of every part of the mechanism, but merely explain the general construction, which is sufficiently intelligible from the illustration.

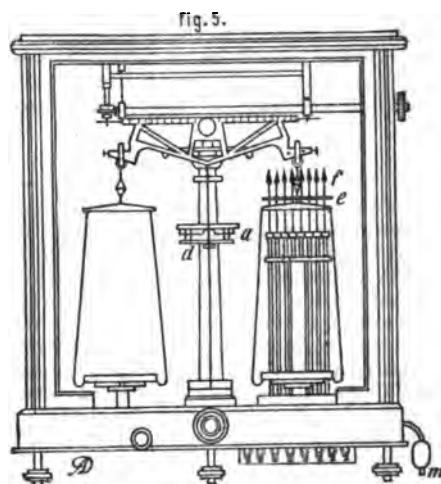
Supposing the substance to be weighed had been put on the scale-pan to the left, and enough weights to come within 1 Gm. had been put on the right-hand scale-pan, the next thing is to close the case. Now, there is a second fixed scale-pan, attached to the right-hand arm at *e*, which is perforated by eight round holes. Through each of these holes passes a wire with long, conical point, and each of these wires passes, a little below the scale-pan, through a guide which causes the wire to be always centred. Each of these wires may be made to rise or fall by pushing the several keys at the bottom of the scale-case. These keys bear upon their face the decimal figure corresponding to the weight which they control. On pressing against any of the keys, the corresponding wire is caused to descend, and the weight which rests upon a



Automatic Pipette.



Leather's Still.



Rueprecht's Balance.

the tube A at D by sliding back the india-rubber joint, and to turn tube A round to any position, *e. g.*, A', which may be convenient for connecting with the receiver. At the same time a small cap of india-rubber is fixed over the open end of the short tube at D. The boiling being recommenced, the vapor passes only through C into the condenser, and the condensed liquid passes out through tube A.—J. WALTER LEATHER in *J. Soc. Chem. Ind.*

PIPETTE FOR RAPID AND AUTOMATIC MEASURING.

WHEN the same quantities of a reagent or other liquid are to be frequently measured off, it is of advantage to employ some automatic measuring apparatus. One of the latest of these is the automatic pipette here illustrated.

The pipette *p* is expanded below, but ends in a capillary orifice, and has a capillary stem, as well as small lateral branch *i*. The branch is connected with the open tube *h* (which may, if desired, be connected with a reservoir of compressed air), and the stem of the pipette with a tube leading through a cork into the vessel *r*. At *a* and *b*, stop-cocks are placed. The vessel *r* is connected with the air-pump.

When using the apparatus, a capsule containing the test liquid is placed below the pipette, the point of the latter dipping into the liquid; next the stop-cock *a* is carefully opened. The action of the vacuum pump will now cause the test liquid to fill the pipette. When the liquid stands above the stop-cock *a*, this is turned off. Should any of it have been carried over, the excess will accumulate in *r*, and may occasionally be drawn off. The pipette is now charged. When it is to be emptied, the stop-cock *b*

small shoulder below their conical point is deposited upon the scale-pan. All the weights are made of wire, and of such a shape that the conical points of the wire will raise them squarely when the keys are released again. It is, however, possible, by a gentle extra pressure, to set the keys so that the weights will remain lying upon the scale-pan until they are purposely released.

A special arrangement is provided for at *a* by means of which the centre of gravity may be depressed or raised at short notice.

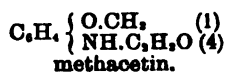
As usual, provision is made for a milligramme rider, and the beam is constructed on the short-arm principle.

Since no currents of air can have access to the scale when the case is shut, and there would be no way of disturbing the equilibrium, when it is once firmly established, except by opening the case again, a little rubber bulb is attached to the bottom at one side, which ends in a fine orifice underneath one of the scale-pans. By gentle pressure a small jet of air is forced against the scale-pan, and the balance thereby set in motion, from which it gradually returns to rest again.—After *Dingler's Pol. Journ.*, 271, 387.

The Tragacanth Market.—Constantinople was formerly the great market for gum tragacanth, but it is now shipped extensively from Bagdad, Beyrout, and Mersine, to which ports the entire produce of Syria and Arabia is at present despatched. In 1887, the business done in this gum presented no noticeable feature, but in 1888 there was a brisk demand for the best qualities from London, and a consequent increase in the supplies, though not in prices. The exports were in 1887-8 1,200 cases, and in 1888-9 2,000 cases.

Methacetin.

A FEW months since, reference was made to a compound that had been reported upon favorably as an antipyretic and antineuralgic, and which, from its analogy to phenacetin, had been named "methacetin." The relation of these compounds to each other is easily apparent on comparison of the formula by which they are represented, from which it appears that methacetin differs from phenacetin in containing a methyl group in the place of an ethyl group:



If the comparison be extended to antifebrin, it may be stated that antifebrin is acetanilide, phenacetin is oxyethylacetanilide, and methacetin is oxymethylacetanilide. Methacetin is now stated (*Pharm. Zeit.*, July 10th, page 419) to crystallize in shining, white, odorless, and almost tasteless scales, melting at 127° C., and boiling undecomposed above that temperature. It is soluble in 526 parts of water at 15° and 12 parts at 100°, whilst phenacetin requires 2,500 parts of water at 15° and 86 parts at 100°; it follows, therefore, that the solubility of methacetin in water is five times as great as that of phenacetin. In alcohol and acetone methacetin dissolves very freely, and also in chloroform, especially when warmed. It is less soluble in benzol, and only difficultly soluble in carbon bisulphide, petroleum, benzin, and ether. Upon cooling or evaporation of a solution, the methacetin separates unaltered in handsome crystals. It is also freely soluble in glycerin and fixed oils, especially when heated, and with more difficulty in turpentine and other essential oils. An aqueous solution is neutral in reaction, and should not be affected by barium chloride, silver nitrate, or ammonium sulphide. Heated on platinum foil, it should burn without leaving any residue. In most of its known chemical reactions it resembles phenacetin, from which it is best distinguished by its physical properties. For instance, if methacetin be heated with insufficient water for its solution, it melts and solidifies again upon cooling, but phenacetin heated with the same quantity of water does not melt. In respect to the therapeutic value of methacetin, Dr. Weller corroborates what has been previously stated, and says that in its action it corresponds in every respect with phenacetin.—*Pharm. Journ.*, July 27th.

The Opium Crop of 1889.

FROM an editorial in the *Chem. and Drugg.* (July 27th), containing information, received from Smyrna, on this year's opium crop, we take the following:

The collection of opium in the principal districts of Asia Minor which produce that important drug is now approaching its end, and although no definite reports are yet to hand from Smyrna and Constantinople regarding the outturn of the harvest, it may be taken as probable that the crop will be about a fair average one, few operators estimating it at less than 6,000 cases, while several generally well-informed firms place it at a not inconsiderable percentage in excess of that figure. At the same time, it should be added that telegrams have been received here this week from Smyrna, the tenor of which is rather in contradiction to the mail news from that place, and indicate that during the last two or three days the Smyrna market has become excited, and that a pretty considerable amount of business has been done at a general advance in quotations. But, in the absence of any definite and reliable details of this improved condition, we see no reason to mistrust the general character of the news from Smyrna, and that does not appear to be of a really alarming character. A crop of 6,000 cases would be scarcely sufficient to cover the normal consumption for a year; but it should not be forgotten that there must be a fairly heavy stock left over from last season, when the opium crop was, it is on all hands acknowledged, an exceptionally good one. This heavy stock, though much of it may be in the hands of very firm holders, will have to be reckoned with as a kind of dead weight in the way of any sustained and considerable upward movement. It is thought that there were about 1,350 cases in stock here at the beginning of this month, and about an equal number in the various Turkish centres, while America might add another 1,000 cases to the aggregate of the other markets. This stock is certainly from 10 to 15 per cent larger than that which was believed to exist at the commencement of last season's campaign; but, on the other hand, the present crop is pretty certain, satisfactory as it is, to fall short of last year's abundant harvest by at least five or six times the amount of the excess in the stock.

Presuming, therefore, our information from Smyrna with regard to the harvest prospects to be correct, a moderate advance seems not at all an unlikely event, though to some extent that advance has already been discounted, the average opium price in Smyrna, at the beginning of the present campaign, being about 20 per cent in excess of that of the 1888 season. Another circumstance which is mentioned as likely to be of some account in keeping the opium prices up is that since the recent establishment in

Smyrna of a branch of the *Crédit Lyonnais Bank*, it has become easier for weak holders to raise money than was formerly the case. Whether this will really have any appreciable influence on the market we cannot judge, but at any rate it is a factor which deserves to be mentioned when passing in review the chances for and against a rise in the value of the drug.

Increase in Opium Culture in China.

THE British consul at New Chang, in Northern China, reports that the importation of Indian opium into his district is falling off to such an extent that another year or two might see it out of the market altogether, were it not that a few well-to-do natives, mostly southerners, will always be found who prefer to give a higher price for their old favorite. The cultivation of the native poppy is making enormous strides, and the great danger of famine which the authorities have to face in any exceptional year will be largely increased, owing to so much of the land being devoted to the poppy instead of to food staples. Some idea of the local consumption of opium may be arrived at from the following figures, which are obtained from reliable Chinese sources. There are in the port of Yingtzu some 2,000 opium shops. An average sale of opium in a day is 5 oz. This gives 2,244 piculs a year for the public opium shops alone. To this must be added what is smoked in private houses, which is estimated at about 1,500 piculs, and this, it must be remembered, is for Yingtzu only, and those few villages round about which are most easily supplied from here. Twenty years ago 2,685 piculs of Indian drug were imported to supply, not Yingtzu, but almost the whole of Manchuria, east of the district supplied through Tientsin; for, though it is true that the native opium was started as long as twenty-four years ago, it was only on a very small scale, and it found very little favor until quite of late years. The population has increased very rapidly, but not in the same proportion as the native opium, and the conclusion is inevitable that opium smoking has increased enormously.

Civet.

CIVET is mainly obtained from the Gallas country, a large tract of land in that part of tropical East Africa culminating in the triangle southeast of Abyssinia. The Gallas have for many years kept civet cats as domestic animals for the sake of the odorous substance yielded by these creatures. There was at one time a regular trade in civet from the Gallas country through the Soudan to Egypt, by the Nile route, and until about ten years ago Cairo was, in fact, the principal distributing centre of this article. A certain quantity of civet, it is true, was also brought from Gallas down to the Red Sea littoral, but this was immediately bought up by Mussulman buyers, who not only use civet very liberally as a perfume—in which shape they call it *Mousoo*—but also use it as a medicine. These buyers sell large quantities to the Mecca pilgrims, who, in their turn, carry it throughout the Mohammedan world, and in fact the importance of their purchases often influences the civet market to a considerable extent. The Soudan war, which is responsible for so many commercial upsets, has also abolished the Cairo civet market, and the principal buyers who formerly frequented it had to look for more direct means of obtaining the perfume. A number of consignments were sent last year via Massouah, and some shipments have also reached Europe by a more direct route through travellers to whom King Menelek of Shoa had given civet in return for certain presents made to him; but no regular supplies can be looked for through the latter medium, travelling in Eastern Abyssinia being interrupted several months each year owing to the heavy rains, while even under favorable circumstances the voyage from the coast to the heart of the Shoa country and back takes nearly six months to accomplish. But, at present, Arab traders are commencing to establish a regular trade route between the port of Zeyla, opposite Aden, and the Gallas region, and in future we shall have to look to that route for our principal supplies of civet. The civet yielded by the wild cats is finer in perfume than that of the domesticated animal, but the two varieties are nearly always mixed together by the Gallas. The Gallas and the Abyssinians very seldom adulterate the civet, but sophistication is extensively practised at the Red Sea ports, as it formerly was in Cairo.—*Chem. and Drugg.* (July 27th, page 145).

Restoring Patients under Chloroform.

IN France, when a patient is under chloroform, on the slightest symptom appearing of failure of the heart they turn him nearly upside down, that is, with his head downward and his heels in the air. This, they say, always restores him; and such is their faith in the efficacy of this method that the operating tables in the Paris hospitals are made so that in an instant they can be elevated with one end in the air, so as to bring the patient into a position resembling that of standing on his head.

Restoring Old Essential Oils.

ACCORDING to the *Pharmaceutische Post* (June 16th, p. 407) an old resinified and malodorous essential oil is best freed from impurities by shaking it for a quarter of an hour with a thin paste made of powdered borax, bone-black, and water, and then filtering, when the oil passes through quickly and bright. To decolorize an oil, it should be distilled with an equal weight of poppy oil and saturated solution of common salt, when it is said the oil passes over colorless to the last drop, whilst all the coloring matter remains combined with the fixed oil.—*Pharm. Journ.*

Iodide of Starch.

PFEIFFER and TOLLENS have decided that the formula of starch is $C_6H_{10}O_5$, and that of the iodide $(C_6H_9O_4)_nI$, $(C_6H_9O_4)_nI$, containing 22.865 per cent I. On this basis, Seyfert proposes to determine starch by dissolving 1 Gm. in water, cooling, adding 50 C.c. of iodine solution, 20 C.c. concentrated HCl, and diluting to 500 C.c. After vigorous shaking, the starch iodide is allowed to settle, and in an aliquot portion of the clear liquid the excess of iodine present is determined by hyposulphite. The iodine solution contains 12 or 13 Gm. I per liter, with sufficient KI to effect solution. The amount of iodine absorbed by the starch, multiplied by 4.37, gives the amount of starch present.—*Dingl. Jour.*, 271, 189; *J. Am. Chem. Soc.*

The Relation of the Caustic Action of Carbolic Acid to the Solvent.

A MIXTURE of 30 Gm. of pure neutral glycerin with 5, 10, 20, and even 30 Gm. of chemically pure carbolic acid may be placed on the skin without causing irritation. But if the glycerin contain water, the mixture is unbearable on the skin. Further examination of this phenomenon showed that the caustic action of pure carbolic acid is greatly reduced by solution in pure glycerin or strong alcohol so long as no water is added. In cases of burns caused by strong carbolic acid, it would therefore be better if strong alcohol were used instead of water to remove the acid from the skin.—P. CARLES in *Journ. Pharm.*, 19, 425; *Journ. Soc. Chem. Ind.*

Thymol Tooth-powder.

THE *Chem. and Drugg.* gives the following as a "good" formula:

Precipitated Chalk.....	15 oz.
Soap, powd.....	1 "
Saccharin.....	10 grains.
Thymol.....	15 "
Camphor.....	80 "
Vanillin.....	5 "
Oil of Rose.....	6 drops.

Rub the camphor and thymol together in a mortar [and warm gently so as to render the mixture liquid]; then add the chalk in small portions at a time, reserving about 1 oz.; next add the other ingredients, the perfumes being first separately rubbed with the remainder of the chalk.

A Syrup for Consumptives.

SCHOEFF proposes the following formula for a combination of calcium superphosphate with balsam of Peru and creosote, which has been found very useful for the treatment of consumptives:

Calcium Phosphate.....	60 grains.
Distilled Water.....	2 drachms.
Hydrochloric Acid.....	75 to 95 minims.

Mix the phosphate with the water and add sufficient acid to dissolve it. Then in the proper manner—

Balsam of Peru.....	30 minims.
Gum Arabic.....	30 grains.
Creosote.....	15 minims.
Syrup, to.....	8 oz.

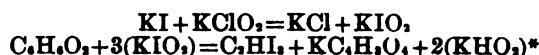
The maximum dose of this syrup is a tablespoonful three times a day, but it is advisable to begin on less, say a teaspoonful.—*Chemist and Druggist.*

Success of Pasteur's Treatment for Hydrophobia.

At the Academy of Sciences, M. Pasteur recently presented a note of the results observed in the Pasteur Institute from May 1st, 1888, to May 1st, 1889 (*La France Médicale*, No. 73). During this period, 1,673 persons bitten by rabid or presumably (*très suspects de rage*) rabid dogs had been treated—1,487 French and 186 foreigners. Of this number—viz., 1,673—118 had been bitten in the head or face. Six persons (4 bitten on the head and 2 on the limbs) had been attacked with rabies during treatment; 4 others were attacked within a fortnight after the close of the treatment; 3 persons bitten on the head died after the treatment had been completely finished, and these, therefore, represent the total cases of failure, viz., in the ratio of 1 in 557. Or if—"which would be illogical," adds M. Pasteur—to these 3 cases were to be added the 10 above mentioned, there would still be a mortality of only 1 in 128.—*Scient. Amer.*

Manufacture of Iodoform.

H. SUILLOTS and H. RAYNAUD have invented a process for manufacturing iodoform from acetone, and transforming all the iodine into iodoform. Basing themselves on the theory that the sodium hydrate transforms the iodine into hypoiodite, which subsequently acts on the acetone, the authors have thought of employing a hypochlorite added to an iodide. If, as they say, they take 1 mol. acetone = 58, and 3 potass iodide = 498, after action of sodium hypochlorate in slight excess, 1 mol. of iodoform will be formed = 394. The reaction is represented by:



The authors have by this process manufactured iodoform on a large scale from the ashes of seaweed.—*Bul. Soc. Chim.*, 51, 1, 4.

On Oil of Wintergreen.

PROF. HENRY TRIMBLE and MR. H. J. SCHROETER, of Philadelphia, have studied the chemical and other properties of natural oil of wintergreen, oil of birch, and also the artificial oil of wintergreen or methyl salicylate of the market. Their results are thus summarized:

I. Previous investigators have found oil of wintergreen to consist of methyl salicylate and a hydrocarbon called gaultherilene; and oil of birch to be composed of methyl salicylate alone.

II. We find, in addition to methyl salicylate, in both a hydrocarbon of the formula $C_{11}H_{14}$, and small quantities of benzoic acid and ethyl alcohol. The amount of the hydrocarbon is from 0.3 to 0.447 per cent, and it becomes solid on standing a short time or on cooling. It is probably made up of a solid and a liquid portion.

III. The oils are physically and chemically identical, the only difference detected being in the melting point of the hydrocarbons. That from wintergreen melted at from 10° to 15° C., and that from birch at 18° C. This may depend on the time of collecting the plants or on the age of the oils.

IV. A representative sample of artificial oil of wintergreen possessed the physical properties but not the chemical composition of the natural oils.

V. The artificial product, when unmixed with the natural oils, may be identified by the addition of excess of potassium hydrate, when all odor of wintergreen will disappear.

VI. It would be undesirable in the next Pharmacopoeia to replace the almost pure natural oils by an impure methyl salicylate of variable and uncertain composition. No reasonable objection can be offered to the designation by the Pharmacopoeia, as oil of wintergreen, of the product from either of the natural sources.—After *Am. Journ. Pharm.*

Cognac.

THE brandy trade is the principal if not the sole industry of Cognac, one of the most ancient towns of France. This trade includes the distillation of the celebrated brandies, the blending of them, and their preparation for market or export. Around these industries, of course, are clustered others, as hoop and stave making, cooper shops, case making, glass blowing, lithographing of labels, etc., not to speak of others directly concerned in the production and manipulation of the brandy. In former years, before the ravages of the phylloxera on the vines of La Charente began to be so severely felt, the great plain lying southeast of Cognac, an ellipse of about 15 by 25 kilometers, was one vast vineyard. Here was produced the grand fine champagne which gave to the brandies of this part of France the pre-eminent name of cognac. These vines have disappeared, however, almost to a root, and all those who formerly made good livings by tilling and pruning the vine and gathering the rich harvest find their vocation gone. It was formerly the custom—and still is when any one is lucky enough to have a vineyard which the phylloxera has spared—for each small proprietor to make his own wine and to distil from it his own brandy. These brandies—new or old, according to the ability of the producer to hold them to age—are sold to the great export houses whose names we see on the labels of bottles of cognac in American restaurants. By these latter the brandies are simply blended. As a matter of fact, I believe but little brandy is distilled by the houses best known in America in connection with cognacs. Of its adulteration, and whence are derived the materials for its legitimate production, I have nothing to say in this place. My predecessor, Mr. Malmros, has already treated ably of that subject in his report on cognac brandy to the Department, December 16th, 1888. It is enough for my purpose to say here that the vines of the Grand Champagne, or, in other words, the environs of Cognac, are dead, and those who were formerly profitably employed in the culture of the vine and the manipulation of its products are either not employed or are inadequately so.—*From Report of U. S. Consul EARLE.*

* (O=S).

Note on the Dilution of Cow's Milk in Infant Feeding.

THE writer, in September, 1886, had occasion to consider this question in his daughter's case, owing to the mother's deficiency in milk. The food used as a substitute on that occasion proved so successful in more than one case that it merits recording.

The formula is mainly based on a process devised by Professor Frankland in rearing one of his own children.

In his paper (published December, 1854), Prof. Frankland gives the percentage amounts of the different constituents of human, ass', and cow's milk as follows:

	Human.	Ass.	Cow.
Casein.....	2.7	1.7	4.2
Butter.....	3.5	1.3	3.8
Milk-sugar.....	5.0	4.5	3.8
Salts.....	.2	.5	.7

These figures for human and cow's milk differ in several respects from the averages, deduced from a wider range of analyses, which are quoted by Mr. Thos. Maben in a paper published in the *Pharm. Journ.* for March 23d (pp. 768 and 769), the most notable differences being those of sugar and fat; but on referring to the *minimum* and *maximum* figures found by Prof. Leeds from analyses of 80 samples of human milk from different sources, it will be seen that those given by Prof. Frankland provide him with a basis for a formula which produces a fair imitation of human milk from that of the cow.

In this formula Prof. Frankland takes no account of the differences in *coagulable* and *non-coagulable* albuminoids existing in each of the respective milks. His process practically consists in a precipitation (by means of rennet) of one-third of the casein from fresh cow's milk, and the addition of one-third more milk-sugar; but this was found by the writer somewhat tedious except to a specially trained person. The process of dilution with water was adopted because it was simpler and would enable the food to be prepared in a few minutes whenever it was required.

Taking Prof. Frankland's figures for the average of fresh cow's milk, as quoted, it will be seen that when it is diluted with water in the proportion of 3 parts of the former to 2 parts of the latter, the average amount of constituents is modified as follows:

Fresh Cow's Milk.....	3 parts, water 2 parts
Casein.....	2.52 per cent.
Fat.....	.28 "
Sugar.....	.28 "
Ash.....	.42 "

From these figures the writer compiled the following formula.

The albuminoids, fat, and milk-sugar are by calculation made to approximate as nearly as possible to the average of these constituents in human milk.

Finely ground oatmeal $\frac{1}{2}$, gradually increasing to $\frac{1}{4}$ oz.	
Fresh Butter.....	1 drachm
Milk-sugar.....	2 "
Fresh Cow's Milk.....	6 fluid oz.
Pure Water.....	4 "
Salt.....	5 gr. or a sufficiency.

Mix gradually the water with the oatmeal, milk-sugar, and salt, so that no lumps are formed in the mixture. then add the milk and butter, and heat to the boiling point in a clean enamelled saucepan. The product should be made up to the measure of half a pint, if necessary, and given lukewarm with a spoon when required.

The oatmeal was introduced as a useful attenuant, and it has been found to act as a laxative, and also as a direct fat and heat-producer in the process of digestion. The process of feeding with a spoon is at first troublesome, but it is to be preferred to the use of a feeding bottle, as, if care be taken to have all the vessels employed scrupulously clean, the infant will enjoy an immunity from thrush (*Oidium albicans*), diarrhoea, and other diseases that follow in their train.—GEO. SMITH, F.C.S., in *Pharm. Journ.*, July 6th.

The Marseilles Oil Trade.

THE total imports of seed oils into Marseilles in 1888 attained 278,527 tons, against 286,770 in the previous twelve months; the falling off has been chiefly in gingelly seed from Bombay, owing to the small crops there. The general state of trade improved considerably during the year, as, by reason of the shorter supplies and substantial rise in tallow and all greases, prices of seed oil rose considerably, and there was a steady sale during the last six months. For 1889 the general opinion inclines to lower values, as the crops of ground-nuts on the Madras and Coromandel coast promise large yields, and the Bombay crops are also full average ones. Under oleaginous seeds are also comprised palm kernels and coprah, which produce concrete oils, and form one of the principal ingredients in the manufacture of soap, which is made of about 30 per cent concrete oil and 60 per cent to 70 per cent seed oils. Coprah gives about 65 per cent oil, and palm kernels about 44 per cent. Nearly the whole of the said imports

of oil seeds, viz., 278,527 tons, have been crushed by Marseilles crushers, giving a production of 100,000 to 110,000 tons of oil. These products are connected with one of the largest and most prosperous industries in Marseilles, viz., the candle and stearin factories of Messrs. Les Fils de Frédéric Fournier, who are among the very largest manufacturers of Europe, their production of stearin amounting to nearly 1,200 tons yearly, and about 16,000 tons of candles, stearin, and tallow. The chief articles used for this production are palm oil and tallow, and their imports of these for 1888 have amounted to 11,551 tons palm oil and 4,195 tons tallow, in addition to common greases and French home-melted stuffs.—*Jour. Soc. Chem. Ind.*

Aluminium.*

(Continued from page 157.)

Properties of Aluminium.

In its physical properties, aluminium (or aluminum) widely differs from all the other metals. Its color is a beautiful white, with a slight blue tint. The intensity of this color becomes more apparent when the metal has been worked, or when it contains silicon or iron. The surface may be made to take a very high polish, when the blue tint of the metal becomes manifest, or it may be treated with caustic soda and then nitric acid, which will leave the metal quite white. The extensibility or malleability of aluminium is very high, ranking with gold and silver if the metal be of good quality. It may be beaten out into thin leaf quite as easily as either gold or silver, although it requires more careful annealing.

It is extremely ductile and may be easily drawn, especial care only being required in the annealing.

The excessive sonorousness of aluminium is best shown by example (large suspended bar being struck). Faraday has remarked, after experiments conducted in his laboratory, that the sound produced by an ingot of aluminium is not simple, and one may distinguish the two sounds by turning the vibrating ingot.

After being cast, it has about the hardness of pure silver, but may be sensibly hardened by hammering.

Its tensile strength varies between 12 and 14 tons to the inch (test sample which was shown having been broken at 13 tons or 27,000 lbs.), ordinary cast iron being about 8 tons. Comparing the strength of aluminium in relation to its weight, it is equal to steel of 38 tons tensile strength. The specific gravity of cast aluminium is 2.58, but after rolling or hammering this figure is increased to about 2.68.

The specific gravity of aluminium being 1, copper is 3.6, nickel 3.5, silver 4, lead 4.8, gold 7.7.

The fusibility of aluminium has been variously stated as being between that of zinc and silver, or between 600° and 1,000° C.

As no reliable information has ever been made public on this subject, my friend, Professor Carnelley, undertook to determine it. I was aware, from information gained at the works at Oldbury, that a small increase in the percentage of contained iron materially raised its point of fusion, and it has been undoubtedly due to this cause that such wide limits are given for the melting point. Under these circumstances, two samples were forwarded for testing, of which No. 1, containing $\frac{1}{4}$ per cent of iron, had a melting point of 700° C.; whereas No. 2, containing 5 per cent of iron, does not melt at 700°, and only softens somewhat above that temperature, but undergoes incipient fusion at 730°.

According to Faraday, aluminium ranks very high among metallic conductors of heat and electricity, and he found that it conducted heat better than either silver or copper. The specific heat is also very high, which accounts for the length of time required for an ingot of the metal to either melt or get cold after being cast.

Chemically, its properties are well worthy of study.

Air, either wet or dry, has absolutely no effect on aluminium at the ordinary temperature, but this property is only possessed by a very pure quality of metal, and the pure metal in mass undergoes only slight oxidation even at the melting power of platinum.

Thin leaf, however, when heated in a current of oxygen, burns with a brilliant, bluish-white light. (Experiment shown.) If the metal be pure, water has no effect on it whatever, even at a red heat. Sulphur and its compounds also are without action on it, while under the same circumstances nearly all metals would be discolored with great rapidity. (Experiment shown using silver and aluminium under the same conditions.)

Dilute sulphuric acid and nitric acid, both diluted and concentrated, have no effect on it, although it may be dissolved in either hydrochloric acid or caustic alkali. Heated in an atmosphere of chlorine, it burns with a vivid light, producing aluminium chloride. (Experiment shown.) In connection with the subject, it may be of interest to state the true melting point of the double chloride of aluminium and sodium, which has always been

* From a paper by Sir H. E. Roscoe (*Journ. Soc. Chem. Ind.*, 1889, 463). We have omitted a few portions which are not of special interest to our readers.

given at 170° to 180° C., but which Mr. Baker, the chemist of the works, finds lies between 125° and 130° C.

Uses of Aluminium.

Its uses, unalloyed, have heretofore been greatly restricted. This is, I believe, alone owing to its former high price, for no metal possessing the properties of aluminium could help coming into larger use if its cost were moderate. Much has been said as to the impossibility of soldering it being against its popular use, but I believe that this difficulty will now soon be overcome. The following are a few of the purposes to which it is at present put: Telescope tubes, marine glasses, eye glasses, and sextants, especially on account of its lightness; fine wire for the making of lace, embroidery, etc.; leaf, in the place of silver leaf, sabre sheaths, sword handles, etc.; statuettes, and works of art; jewelry and delicate physical apparatus; culinary utensils, harness fittings, metallic parts of soldiers' uniforms, dental purposes, surgical instruments, reflectors (it not being tarnished by the products of combustion), photographic apparatus, aeronautical and engineering purposes, and especially for the making of alloys.

Alloys of Aluminium.

The most important alloys of aluminium are those made with copper. These alloys were first prepared by Dr. Percy, in England, and now give promise of being largely used. The alloy produced by the addition of 10 per cent of aluminium to copper, the maximum amount that can be used to produce a satisfactory alloy, is known as aluminium bronze. Bronzes, however, are made which contain smaller amounts of aluminium, possessing in a degree the valuable properties of the 10-per-cent bronze. According to the percentage of aluminium up to 10 per cent, the color varies from red gold to pale yellow. The 10-per-cent alloy takes a fine polish, and has the color of jewellers' gold. The 5-per-cent alloy is not quite so hard, the color being very similar to that of pure gold. I am indebted to Prof. Roberts Austen for a splendid specimen of crystallized gold, as also for a mould in which the gold at the Mint is usually cast, and in this I have prepared ingots of the 10 and 5 per cent alloys, so that a comparison may be made of the color of these with a gold ingot cast in the same mould (for the loan of which I have to thank Messrs. Johnson, Matthey & Co.), all of which are before you.

I have also ingots of the same size, of pure aluminium, from which an idea of the relative weights of gold and aluminium may be obtained.

To arrive at perfection in the making of these alloys, not only is it required that the aluminium used should be of good quality, but also that the copper must be of the very best obtainable. For this purpose only the best brands of Lake Superior copper should be used. Inferior brands of copper or any impurities in the alloy give poor results. The alloys all possess a good color, polish well, keep their color far better than all other copper alloys, are extremely malleable and ductile, can be worked either hot or cold, easily engraved; the higher grades have an elasticity exceeding steel, are easily cast into complicated objects, do not lose in remelting, and are possessed of great strength, dependent, of course, on the purity and percentage of contained aluminium. The 10-per-cent alloy, when cast, has a tensile strength of between 70,000 and 80,000 lbs. per square inch, but when hammered or worked the test exceeds 100,000 lbs. (A sample shown broke at 105,000 lbs.)

An attempt to enumerate either the present uses or the possible future commercial value of these alloys is beyond my present purpose. I may, however, remark that they are not only adapted to take the place of bronze, brass, and steel, but they so far surpass all of those metals, both physically and chemically, as to make their extended use assured. (Sheets, rods, tubes, wire, and ingots shown.)

But even a more important use of aluminium seems to be its employment in the iron industry, of which it promises shortly to become a valuable factor, owing to certain effects which it produces when present, even in the most minute proportions. Experiments are now being carried on at numerous iron and steel works in England, on the Continent, and in America. The results so far attained are greatly at variance, for while in the majority of cases the improvements made have encouraged the continuance of the trials, in others the results have not been satisfactory. On this point I would wish to say to those who may contemplate making use of aluminium in this direction, that it would be advisable before trying their experiments to ascertain whether the aluminium alloy they may purchase actually contains any aluminium at all, for some of the so-called aluminium alloys contain little or no aluminium, and this may doubtless account for the negative results obtained. Again, others contain such varying proportions of carbon, silicon, and other impurities as to render their use highly objectionable.

It seems to be a prevailing idea with some people that because aluminium is so light compared with iron, they cannot be directly alloyed, and, furthermore, that for the same reason alloys made by the direct melting together of the two metals would not be equal to an alloy where both metals are reduced together. Now, of course, this is not

the case, and the statement has been put forward by those who were only able to make the alloys in one way.

Aluminium added to molten iron and steel lowers their melting points, consequently increases the fluidity of the metal, and causes it to run easily into moulds and set there, without entrapping air and other gases, which serve to form blow holes and similar imperfections. It is already used by a large number of steel founders, and seems to render the production of sound steel castings more certain and easy than is otherwise possible.

One of the most remarkable applications of this property which aluminium possesses of lowering the melting point of iron has been made use of by Mr. Nordenfelt in the production of castings of wrought iron.

Aluminium forms alloys with most other metals, and although each possesses peculiar properties which in the future may be utilized, at present they are but little used. —*J. Soc. Chem. Ind.*

The World's Production of Wine.

THE U. S. Consul at Marseilles, under date of February 27th, 1889, sends the following:

The following table shows the results of the vintage of 1888 in all countries (except Germany, which is not reported) where the product of wine is sufficiently important to be taken into account. The aggregates are given in hectoliters of 26.42 gallons:

Countries.	Hectoliters.
France.....	30,102,000
Algeria.....	2,728,273
Italy.....	30,217,000
Spain.....	23,000,000
Portugal.....	5,000,000
Austria.....	8,500,000
Hungary.....	7,000,000
Russia.....	8,500,000
Turkey and Cyprus.....	2,600,000
Greece.....	1,760,000
Switzerland.....	1,100,000
Roumania.....	700,000
Servia.....	2,000,000
California ..	750,000
Total	118,957,273

Or 3,010,751,152 gallons.

The International Pharmacopœia.

At the recent International Congress of Therapeutics, Materia Medica, and Pharmacology, held at Paris, Professor Schaer (of Zürich) summarized the report he had drawn up in answer to the question of a Universal Pharmacopœia. He particularly insisted on the point that an official commission, appointed by the various governments, would have better success than any voluntary body more or less representative. Then a universal pharmacopœia should not attempt to do too much, but only comprise the most important, especially the poisonous, preparations. He would not insist upon any particular language for the text, yet would prefer Latin. The titles, at least, should be in Latin, with a sufficient number of synonyms. A table of maximum doses should be given, as well as a description of the poisonous substances and their preparations. M. Planchon said that in the main he agreed with M. Schaer. The first International Pharmacopœia Committee prepared a most complete pharmacopœia, but it was not adopted. M. Schaer's plan, however, to have only a partial and limited codex, seemed quite practicable. On one point he disagreed, namely, the idea of trying to have an official international commission appointed. It is better that the profession should come to an agreement among themselves on a limited pharmacopœia, and then apply to their respective governments and say, "This is what we have all agreed upon." Legislative sanction could no doubt afterwards be obtained without difficulty. As to nomenclature, the Latin scientific name is the most important, next the vulgar synonyms. There would be no difficulty about weights and measures. But the table of maximum doses would be perplexing, as there seem to be national idiosyncrasies about the tolerance of medicines. On the whole, however, we are slowly nearing a solution, and there are hopes that the coming congress at Milan may bring the project to a successful issue. —*Chemist and Druggist.*

Ichthyol Collodion in Erysipelas.

THE local application of a coating of ichthyol collodion, prepared according to Dr. Unna's formula, is reported to be one of the most efficient means of subduing the intumescence and of cutting short the course of erysipelas, in conjunction with proper internal remedies. The formula of Unna's ichthyol collodion is as follows:

Ichthyol,	
Ether.....	āā 3 5
Collodion.....	3 10

Ichthyol is understood to be the ammonium salt of ichthyo-sulphonic acid, that is, sulphichthyolate (or better ichthyo-sulphonate) of ammonium.

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FREDERICK A. CASTLE, M.D. EDITOR.

CHARLES RICE, Ph.D. ASSOCIATE EDITOR.

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EDITORIAL.

IN an editorial in our last May number (page 97), we announced the fact that the then Acting Secretary of the Treasury had rendered a decision regarding the use of *alcohol free from internal revenue tax*, which appeared to enable hospitals to obtain and use this costly commodity at a comparatively low price. Our information was based upon copies of letters, printed documents, and circulars, which showed not only that the decision of the Treasury Department alluded to above had been rendered in favor of the Roosevelt Hospital of New York City, but that other hospitals were availing themselves of the same privilege and were being supplied with tax-free alcohol.

Since that time, however, we have gone through some practical experience which induces us to issue a friendly caution to those who have already applied the above-mentioned Treasury decision to their own case, or who contemplate doing so. Of course, so far as the special institution in whose favor the decision was originally rendered is concerned, the matter is settled, since it is to be presumed that the same is fully entitled to the privileges accorded to it. But we fear this is not the case with many others.

Shortly after the before-mentioned decision had been rendered, one of the editors of this journal was authorized and instructed to take the initiatory steps to have the decision apply to the alcohol used in certain public hospitals of the city of New York, it being presumed that the conditions and circumstances of the case were similar to those covered by the original decision. It being necessary to proceed with the utmost care, so as not to involve the city, or any of its employees, into difficulties, every step was carefully considered, and the proper documents finally drawn up in accordance with the prescribed regulations of the Treasury Department. Before these documents were actually filled in, however, a copy (in blank) was forwarded to the Secretary of the Treasury, explaining that the tax-free alcohol was intended to be used for the very same, and no other, purposes as those mentioned in the previous decision, viz.: (1) in the manufacture, in the laboratory, of tinctures, liniments, and other pharmaceutical preparations for use in the hospital wards and in the out-patient department; (2) as a lotion for bathing the afflicted parts of the patients under treatment in the hospital and out-patient department; (3) as an antiseptic wash

by the surgeons before and after operations in both departments; (4) as an antiseptic solution for cleaning surgical instruments; (5) as an antiseptic solution for preparing and preserving catgut ligatures to be used in surgical operations; (6) for burning in spirit lamps, principally in the analysis of urine.

The reply of the Secretary of the Treasury was very explicit, quoting the paragraph of the Revised Statutes of the United States referring to the case of tax-free alcohol (see our editorial in the May number), and finally stating that, if it could be shown to the satisfaction of the proper government authorities that the institutions for which the tax-free alcohol is intended are "a chartered or incorporated scientific institution or college of learning," or "that they are a scientific university or college of learning created and constituted such by any State or Territory under its laws, though not incorporated or chartered," then the necessary permission would be granted to withdraw alcohol from bond free from tax.

It was, however, impossible to comply with these conditions of the law, as none of the hospitals for which the tax-free alcohol was intended is legally entitled to be called "a scientific institution," "college of learning," or "scientific university." It is true that at least one of the hospitals in question stands in intimate connection with medical colleges. Yet this connection is merely a formal one, and not established by legal bonds of any kind. As it was, therefore, impossible to prove any right to the use of tax-free alcohol under the existing law, the matter was dropped.

It may not be known to many of our readers that the conditions under which the above-named scientific bodies are permitted to obtain alcohol free from tax are very strict and, to some extent, risky for the persons whose names appear on the official documents. The application for tax-free alcohol must refer to certain specifically described packages of alcohol stored in some particular warehouse. It cannot be made for an indefinite quantity of alcohol, or for alcohol required during a stated time. Hence, when the supply of alcohol obtained upon such application is exhausted, a fresh application must be made for other packages, minutely described as in the former case. The application must be made by the president or the curator of the scientific body, and he must procure two bondsmen, satisfactory to the Treasury Department, who have to give bonds in double the amount of the internal revenue tax originally chargeable against the alcohol. The responsibility of the principal (president or curator) and of the bondsmen does not cease at a stated time, nor when the alcohol is consumed and a new application is made, but continues until it has been shown to the satisfaction of the proper authorities that the alcohol has been used legitimately for the sole purposes for which it was released tax-free. We have been informed by one of the best-posted and most prominent representatives of the alcohol market that, according to his experience, the prosecution and persecution of those who, even innocently and unknowingly, infringe the conditions under which tax-free alcohol is obtained, is so persistent and annoying that the utmost care should be exercised by those who put their names to the official documents to see that the conditions of the law are strictly complied with.

Our object in presenting this subject to our readers is to advise those who have thus far applied to their own case the decision of the Treasury Department specifically applying to the Roosevelt Hospital, most carefully to consider their position, so that no harm may befall them from government prosecutions hereafter.

While it will thus be seen that there are probably but few hospitals in the country which will be able to take advantage of the existing law regarding tax-free alcohol, it is to be hoped that some steps will be taken, if possible, at the next session of Congress, to extend the benefits of the act also to other hospitals, provided the latter can offer proper guarantees regarding the keeping, use, and consumption of tax-free alcohol. We are, from principle, in favor of *free alcohol in medicine and in the arts*. But we readily see the difficulty of releasing it in one direction while retaining it in bond for all others. Nevertheless, we are sure that the law could easily be extended so as to include hospitals and similar institutions (asylums, alms-

houses, etc.) which do not charge either for treatment or for medicines. Of course, this class of institutions, which is almost exclusively supported either by taxation or by charitable contributions, stands on an entirely different position from those which are supported altogether or chiefly by the money derived from the board of the inmates. It is well known that some of the latter institutions charge very high prices, and it may, therefore, be inferred that they are easily able to pay a higher price for alcohol.

The present statute leaves the granting of any permit for the use of tax-free alcohol to the discretion of the Secretary of the Treasury, since it distinctly says: "The Secretary of the Treasury *may* grant permits," etc. Of course, this discretion is exercised in such a way that, if the applicant is found to be legally entitled to it, and if he complies with all the rules and regulations issued by the department regarding the matter, he is never refused the privilege. Hence, if the present law were extended to hospitals and similar institutions, the Secretary of the Treasury would still possess the authority to inquire into the claims of any of these institutions and to refuse the privilege to any whom he may find not entitled to it. To make the statute apply to the institutions which we are sure ought to participate in its benefits, we would propose that it read as follows, the *italics* being the addition proposed by us:

(Revised Statutes of the United States.) § 3297. The Secretary of the Treasury may grant permits to any incorporated or chartered scientific institution or college of learning to withdraw alcohol in specified quantities from bond without payment of the internal revenue tax on the same, or on the spirits from which the alcohol has been distilled, for the sole purpose of preserving specimens of anatomy, physiology, or natural history belonging to such institution, or for use in its chemical laboratory. Also to any scientific university or college of learning created under its laws, though not incorporated or chartered. *Also, for medicinal or surgical purposes, to any hospital, asylum, dispensary, or similar institution, operated under a charter, or owned or controlled by any Territory or State or any of their political subdivisions, provided such hospital, asylum, dispensary, or similar institution does not exact any charge or fee for the treatment of its inmates or patients, or for the medicines supplied to them.*

CORRESPONDENCE.

Commercial Saccharin.

EDITOR OF AMERICAN DRUGGIST.

DEAR SIR:—The statement of Dr. A. R. L. Dohme, of Baltimore [abstract of his thesis, presented to the Johns Hopkins University], in the last July number, page 140, of the AMERICAN DRUGGIST, regarding impurities in *saccharin*, is not quite correct, and we wish to say the following: We, that is, the manufacturers, have never claimed to put a chemically pure saccharin on the market; our claim is simply that we sell a saccharin which is 300 times sweeter than sugar. As we have always fulfilled this condition, it is altogether immaterial what percentage of the pure substance ("orthosulphaminebenzoic acid") is contained in the commercial article. In fact the saccharin which we have in the market now contains 60 per cent of orthosulphaminebenzoic acid (the true sweet principle), but not 30 to 40 per cent, as Dr. Dohme claims to have found.

It is entirely in our, that is, the manufacturers' power to regulate the percentage of orthosulphaminebenzoic acid, and as a proof we shall, within a short time, put on the market a medicinal saccharin, which is 500 times sweeter than sugar, and contains only traces of parasulphaminebenzoic acid (this is the substance to be met with in our present commercial article, besides the orthosulphaminebenzoic acid).

Had we been called upon to furnish a chemically pure product, we would have been well able to do so; but, in consideration of the price, it was our intention to place on the market a product 300 times sweeter than sugar.

Naturally the price of the medicinal saccharin (a sample of which we left with you) is considerably higher than that of our present commercial article.

We shall be thankful to you if you will kindly publish this statement in the next issue of the AMERICAN DRUGGIST.

Yours, very truly,

LUTZ & MOVius,
per C. Schmidt.

New York, August 17th, 1889.

Correction.

ON page 137 of our July number appears a short communication by MR. FRANK EDEL in which, by an accident beyond the editors' control, the sign "z" has been used instead of "oz." We therefore repeat the essential part of the communication.

Mr. Edel criticises a formula which we had given in a preceding issue for the preparation of 7 troy ounces of citrate of sodium (required as an ingredient in Tinctura Ferri Citrochloridi, *Nat. Form.*), and shows that the proportions were incorrect. He points out that the correct proportions for preparing seven troy ounces of neutral citrate of sodium ($\text{Na}_2\text{C}_6\text{H}_5\text{O}_7$) are:

Bicarbonate Sodium, 99%.....2,896 grains.
Citric Acid.....2,847 "

The Next International Pharmaceutical Congress.—It has already been announced in these pages that the International Pharmaceutical Congress, which was appointed to meet at Paris during the present summer, has been postponed until next year, for various reasons, chiefly because several other pharmaceutical congresses are to meet during the present year, which would have made it difficult to secure the attendance of many representative members of the profession.

A short time ago the Committee of Organization, consisting of Prof. Stanislao Cannizzaro, President; Profs. Dioscoride Vitali, Alfonso Corradi, and Giuseppe Pessina, Vice-Presidents; Dr. Arturo Castoldi and Mr. Venturini Vittorio, Secretaries, issued a circular in which they request intending visitors to the congress (to meet at Milan in 1890) to propose subjects for discussion, or to forward papers to be submitted, at as early a date as possible. They also announce that the following will be entitled to participate as members:

1. Professors in universities, polytechnic and other higher schools.
2. Professors of branches of natural history of all schools.
3. Apothecaries and chemists who are sent as delegates by pharmaceutical associations or by governmental authority.
4. Members of sanitary departments.
5. Assistants at laboratories, museums, or other similar institutions.
6. Chemists, directors, assistants, demonstrators of boards of health of cities, of agricultural experimental stations, or of other public laboratories.
7. Proprietors or directors of chemical establishments, and chemists who are employed there.

It is requested that those who intend to participate in the congress notify the committee at latest by the 30th day of November, 1889. If desired, each applicant will be furnished with a programme of the congress. And each application should be accompanied by the sum of 10 francs, whereupon a card of admission will be forwarded.

College of Pharmacy of the City of New York.—The regular lecture term for the session 1889-'90 will begin on Monday, October 7th. The Laboratory Courses will commence on September 11th. On October 4th, at 1 P.M., will be held the Preliminary or Entrance Examination, also the Supplementary Examination of the Juniors (who failed to pass in the spring examination), and the examination for Free Scholarship (that is, a free senior course). The applications so far on file show that the classes in the coming session will be considerably larger than in any previous year. Ample preparations have been made by the Trustees and Professors to impart to the students the best instruction, both theoretical and practical, in the several departments.

The new Austrian Pharmacopœia (ed. VII.) has been completed and will be issued shortly. It will go into effect on Jan. 1st, 1890. It will contain 578 articles, or 43 more than in the preceding edition, published in 1869. From an advance notice furnished to the *Chemist and Druggist* we take a few items regarding its contents. Opium to be used in medicinal preparations is required to contain 10 per cent of morphine. Cinchona is required to be the succirubra, with 3.5% of alkaloids. Lanolin is made official, and is defined as wool fat containing 30 per cent of water. Sulphate of quinine is to be tested by Kerner's test, the temperature of the solution being fixed at 60° C. (to break up the "latent double salts"; of course the filtration is to be made at 15° C.). A few methods of testing have been introduced for some toxic galenic preparations. A few fluid extracts have also been adopted, and the process of percolation in the preparation of several solid extracts. Synonyms which hitherto have accompanied the scientific and common names of the articles are now placed in a table at the end of the book. To take their place, we have the names of the preparations used in foreign pharmacopœias, "this being perhaps the most useful and sensible addition to the Pharmacopœia, considering the frequency with which Continental pharmacists are now called upon to dispense foreign preparations."

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,359.—Mildew Spots (Little Rock).

Mildew spots on white goods may in most cases be removed by a bleaching process. This may be done in a variety of ways, depending, to some extent, upon the nature and texture of the fabric. The latter should be thoroughly washed, and, while still damp, may be immersed, or touched over, with dilute Javelle water, or with peroxide of hydrogen solution. Dilute bromine water may also be used. Sometimes a treatment similar to that used for removing ink stains is successful, viz., treating the stains with a very concentrated solution of oxalic or citric acids, or both. In most cases it is of advantage to expose the fabric, in a damp state, to the rays of the sun.

No. 2,360.—Chartreuse (R.).

This correspondent asks whether in the formula for Chartreuse printed in our volume for 1888 (page 75), which was taken from the *Industrieblätter*, the quantity of oil of angelica should not be 4 parts instead of 24 parts.

We have consulted several works treating of the manufacture of compound liquors and essences, and while all of them give different formulas for "Chartreuse," yet we judge, from the proportions between the other oils, that the amount of oil of angelica (24 parts) is probably intended.

Dorvault quotes the following formula:

Oil of Melisse.....	2 Gm.
" Hyssop.....	2 "
" Angelica.....	10 "
" Peppermint.....	20 "
" Mace.....	2 "
" Cloves.....	2 "
Sugar.....	q. s.
Alcohol, 80%.....	2 liters.

Color yellow with tincture of saffron, or green with subsequent addition of a few drops of indigo solution.

Dorvault's formula calls for 57 Gm. of essential oils to 3 liters of alcohol. Among the essential oils are 30 Gm. of oil of peppermint, which appears altogether too much. The first-quoted formula requires no oil of peppermint at all, and is much weaker in essential oils.

We do not know the true composition of "Chartreuse," and do not believe that it has ever been exactly imitated.

No. 2,361.—Opium Assay (Cleveland).

If you have not had considerable practice in assaying opium, you will find that, no matter what process you use, you will at first obtain results—even from the same opium—which are not very close. At least this is the general experience. There are several good processes for assaying opium, but each of them contains certain manipulations which must be carried out with the utmost care to prevent loss of morphine.

Opium assay may have two distinct objects. One is a scientific one, viz., to ascertain how much morphine the opium contains. This side of the question is at the same time a practical one, in so far as the passage of the opium through the Custom House is concerned. For if it can be shown that any opium contains fully 9 per cent morphine—by any process leaving no doubt of the result—it will be admitted into the country. Here it is where the several assay processes undergo their crucial test. Another object of opium assay is a purely practical one, viz., the value of the opium to the manufacturer of morphine. No manufacturer succeeds in extracting the whole of the morphine from the opium he works up; he aims to extract the utmost quantity which it pays him to obtain with the process he follows. To the manufacturer, therefore, that process of assay will be the preferable one which tells him exactly how much salable morphine he will obtain from the opium. The question, how much morphine the opium actually contained, will interest him only so far as to stimulate him to improve his process from time to time.

It is now pretty well conceded that the assay process of the U. S. Pharm. of 1880 requires certain improvements, provided it is retained at all. The experience of the last decade has, however, shown that all processes in which lime is used for separating and extracting morphine are liable to yield low results, because any excess of lime will dissolve or keep dissolved some of the morphine, and it is practically impossible to so regulate the quantity of lime that it will be just sufficient for setting the morphine free, without being in excess. For this reason it is probable that the ammonia-ether-alcohol process will be reintroduced, unless a still more accurate method is discovered.

Dr. Squibb, who has had a most extended experience in assaying opium, has recently published a paper on the subject (in *Ephemeris*, III., page 1150), in which he gives

a detailed description of his method of assay, which differs from his former in a few points where he has introduced certain modifications, after assuring himself of their advantage. As it appears to be of importance that this process should be thoroughly tested, we have prepared an abstract of it (originally for another purpose), and give it here:

Opium (in any condition to be valued).....10 Gm.
Alcohol, not above spec. grav. 0.815,
Ether, not above spec. grav. 0.725,
Water of Ammonia, spec. grav. 0.960,
Lime Water,
Water.....of each a sufficient quantity.

Introduce the opium into a flask of 100 C.c. capacity, and add to it 100 C.c. of water. If the opium was in a lump, reduce it previously to small, thin slices, and macerate it for twelve hours, occasionally well shaking it. If it was in powder, macerate it for two hours, agitating from time to time. Pour the opium mixture in the centre of a well-wetted, tared, and strong filter of 12 Cm. (4.8 inch.) diameter, receive the filtrate in a beaker marked at 150 C.c., and wash the flask and residue with enough water to obtain this volume. Then carefully return the residue to the flask, add 50 C.c. of water, shake well for five minutes, and return the mixture to the filter. Receive the new filtrate in another beaker, marked at 150 C.c., and wash the flask, residue, and filter with water to obtain this amount. Evaporate the second weaker solution in a tared capsule of 250 C.c. capacity, on a water-bath, to about 10 C.c. Then add the stronger solution, and continue the evaporation to 14 Gm. Transfer the residuary liquor, after dissolving all crusts or rings upon the capsule, by rotating the liquid about, to a tared Erlenmeyer flask of 100 C.c. capacity. Rinse the capsule with three portions of 2 C.c. each of water, and, lastly, add enough water, if necessary, to make the solution in the flask weigh 20 Gm. To this add 10 Gm. (12.8 C.c.) of the alcohol above directed, and shake well. Next add 17.5 Gm. (or 25 C.c.) of the ether and shake again. Now add 3.5 Gm. (or 3.5 C.c.) of water of ammonia, stopper the flask, and shake vigorously for ten minutes. Then set it aside for at least six hours. Pour off the ethereal layer as closely as possible, add 20 C.c. of fresh ether, and swing the flask gently about with a rotating motion. Pour off the ethereal layer and repeat the washing with another 20 C.c. of ether. Having placed two counterbalanced filters, of 9 Cm. (3.6 in.) diameter, one within the other, into a funnel, wet them well with the ether, and transfer upon the inner one the ethereal layer as closely as practicable; next pour in the aqueous layer, holding in suspension as much of the crystallized morphine as possible. Remove the last crystals from the flask by rinsing with several portions of water, about 3 C.c. at a time. When all the crystals are on the filter, allow water to fall, drop by drop, from a pipette held about 4 inches over the funnel, upon the edges of the filters and the crystals, until the latter look fairly clean, but so that the filtrate and washings do not exceed 50 C.c. Then displace the water from the filters and crystals by dropping upon them 5 C.c. of a saturated solution of morphine in alcohol (of the before prescribed spec. grav.), and before the alcohol has time to evaporate follow it, in the same manner, with 5 C.c. more of the ether. When this has drained off, close the filters upon the crystals, and press them between bibulous paper, under weights, for half an hour. Then open the filters, spread the morphine over the inner one, and dry both at 60° C. (140° F.) to a constant weight, which is to be noted.

Transfer 0.5 Gm. of the dry crystals to a graduated cylinder, add 50 C.c. of lime water, and tilt the cylinder to and fro, without shaking, so as to avoid frothing. If the morphine was fairly pure (free from narcotine, etc.), it will be entirely and quickly dissolved. In this case, the weight of the dried morphine obtained, multiplied by 10, will indicate the percentage of hydrated morphine ($C_{17}H_{19}NO_5 \cdot H_2O$; mol. w. 303) in the opium.

If the lime water did not dissolve the whole of the morphine, filter the liquid through two counterbalanced filters of 7 Cm. (2.8 inch) diameter, placed one within the other, wash the filters first with 5 C.c. of lime water, close the filters, press them between bibulous paper, dry them at 100° C. (212° F.), and weigh one against the other. Deduct the weight of the dry residue from that of the crude morphine first obtained, and multiply the remainder with 10 as in the previous case.

No. 2,362.—Repercolation (Columbus).

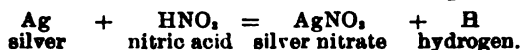
The process of "repercolation," devised originally by Dr. Edward R. Squibb, has been often described and may be found in most works of reference relating to pharmacy, such as the Dispensatories, Squibb's *Ephemeris*, and many pharmaceutical journals. As you ask for a reference in ours, we may point out our answer to query 1,982, "Percolators and Percolation," on page 157 of our volume for 1887. This gives a practical and detailed instruction regarding every step of the process. We may also refer you to *NEW REMEDIES*, 1879, page 1.

No. 2,363.—Construction of Chemical Equations (S. J. P.).

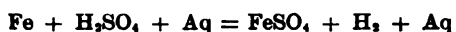
This subscriber writes that he has much difficulty in balancing chemical equations. He has been unable to ob-

tain any material aid from books, there being only two methods that he has come across, viz., an algebraic one (see below) and the system of positive and negative bonds devised by Prof. O. C. Johnson, given in Prescott's "Qualitative Analysis." But the latter he finds to be too complicated. He therefore asks our advice in the matter.

In the first place, it should be stated that it is next to impossible to balance chemical equations, unless it is known beforehand what the results of the reaction are. For instance, it is impossible, theoretically, to predict what would be the action of nitric acid upon metallic silver; in other words, it would be impossible to predict how many molecules of one would be required to react with a certain number of molecules of the other. It is necessary that we shall know all the products of reaction, which can only be ascertained by experiment. Since we find a copious evolution of nitric oxide, when nitric acid acts upon silver, and since it can be shown that no free hydrogen is given off, it is evident that the reaction cannot take place thus:



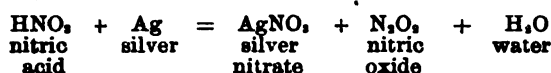
In order that a chemical equation be correct or balanced, it is, of course, necessary that the number of atoms of each element entering into the equation shall be the same on both sides. To find out how many molecules of each reacting substance have to be taken so as to produce whole molecules of the products often requires merely common sense, as for instance in this case:



where any one familiar with the experiment will see that the equation is correct and complete as it stands. In more complicated reactions, however, some aid is very useful. Though our correspondent says that he is acquainted with an algebraic method, we cannot be quite sure whether it is the same which we once laid before our readers. But as it is the only easy and sure method known to us, and as it is so generally useful, particularly to students, we will describe the method (perfected by Prof. Schwanert) again. We shall not enter into a mathematical demonstration of its correctness, as this is entirely unnecessary, its validity being almost self-evident.

1. To balance an equation correctly it is necessary to know each reacting substance and each product.

2. Knowing these, put down both sides of the equation, writing only one molecule of each substance, for instance,



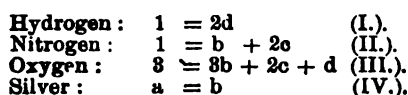
3. Assign to the first member the coefficient 1, and distinguish each succeeding member by a letter; for instance thus:



Note.—This equation contains five different substances with an undetermined number of molecules, which represent five unknown quantities to be determined. One of these is put equal to 1, and the other four are expressed in terms depending upon it; hence these other coefficients will be fractions or multiples of 1.

4. Next put down successively each element occurring on the left sides of the original equation, and construct for each an equation, the left and right side of which contain the number of atoms of this element occurring in the several terms.

Note.—Referring to the formula given under § 3, put down the equation as follows:



This may be read as follows:

One (1) atom of hydrogen is on the left side of the original equation, and 2 atoms are on the right, in the last term having the coefficient d . One (1) atom of nitrogen is on the left side, and on the right there is 1 atom in the term having b as coefficient and 2 in that having c . Three (3) atoms of oxygen are on the left, and on the right there are 3 atoms in the term having b as coefficient, 2 in that with c , and 1 in that with d . One (1) atom of silver is on the left, and 1 atom is on the right.

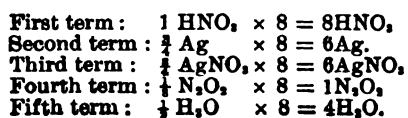
5. Now solve the above four equations in the usual manner algebraically.

Note.—We shall thus obtain, as results, the following values:

$$d = \frac{1}{2}; b = \frac{2}{3}; c = \frac{1}{3}; a = \frac{2}{3}.$$

6. Multiply these fractions with a number converting them into the most simple whole numbers, and multiply with the same number also the coefficient 1 of the first term.

Note.—We thus obtain:



Hence the original equation, when completed, will look as follows:



Professor O. C. Johnson's method, which indeed goes further than the above mechanical one, and frequently helps to find the possible products of a reaction, cannot be explained at length in these pages for want of space. It is, however, of the greatest service to those who have made themselves thoroughly familiar with it.

No. 2,364.—Solution of Crude Carbolic Acid (N. Y.).

This writer asks us to indicate a method for preparing a clear 5-per-cent solution of crude carbolic acid.

Crude carbolic acid is a rather variable article, containing carbolic and cresylic acids, besides a variety of other substances, among which are some tarry bodies. It is not to be expected that the whole of any sample of crude carbolic acid is dissolved by 20 or even more parts of water, since some of the constituents are practically insoluble in that liquid. But the real carbolic and cresylic acids are certainly soluble in 20 parts. All that is necessary, therefore, is to insure the actual solution of these constituents, and subsequently to produce a clear liquid by filtration.

A good way would be the following: To 20 parts of hot water gradually add 1 part of crude carbolic acid, assiduously stirring, and allow to become cold. Then mix with the liquid some insoluble powder—such as fuller's earth, phosphate of calcium, talcum, etc.—and having incorporated this thoroughly, filter in the usual manner. If the first portion of the filtrate does not run off clear, return it. We find it but seldom necessary to filter our solution, which is made by the barrel. After the solution has become thoroughly cold in it, and the barrel is left undisturbed, the solution generally clarifies itself.

When ordering crude carbolic acid, you may mention some brand, if you happen to know that it is reliable. By purchasing the article from a respectable house, and pointing out that you want the best which the market affords, we have no doubt you will receive a good quality. There is, of course, much vile trash sold under this name. Some of it is so offensive to the nostrils that it can scarcely be borne.

No. 2,365.—Catillon's Peptone (B. F. & Co.).

This peptone has been much praised by Dr. Dujardin-Beaumetz. In his "Lectures on Diseases of the Stomach and Intestines" he thus describes its mode of preparation:

One kilo (2 pounds) of beef, freed from its fatty and tendinous parts, and finely chopped, is digested at a temperature of 113° F. for twelve hours in 10 pints of water acidulated with 300 grains of pure hydrochloric acid, spec. grav. 1.180, and with pepsin in slight excess. The proportion of the latter can only be determined by its standard of strength. It will take, for instance, says the author, 35 Gm. of the pepsin of the Codex, which digests 30 to 40 times its weight of fibrin; this pepsin is the "pepsin extractive" which comes in a pasty form, and is not the amylaceous pepsin which digests only six times its weight of fibrin. [Dujardin-Beaumetz evidently had no knowledge of the existence of higher-grade pepsins.] The mixture is agitated from time to time, and kept at a constant temperature. Below 104° F. the digestion of the fibrin is retarded; if the temperature of 122° F. is exceeded, the risk is incurred of destroying the pepsin, and this is sure to happen at 158° F. The mixture, at first in a state of pulp, becomes fluid by degrees, and after a time, varying from two to six hours or more, according to the strength of the pepsin, it attains a complete transparency. It then consists of a mixture of peptones and syntonin, and is not coagulated by heat and nitric acid. After twelve hours of digestion, the mixture is filtered to separate the insoluble parts. Rapidity of filtration is an indication that the transformation is complete. The filtered liquid is next neutralized with bicarbonate of sodium and evaporated to a density of 1.150. It then contains, says the author, half its weight of solid peptones. If it has been prepared from beef, it has a deep yellow color, a disagreeable odor [which may be corrected and overcome by spices and aromatics], and a slightly acid taste.

No. 2,366.—Lime Juice (H. J. P.).

Lime juice is a commercial term usually applied to the concentrated juice of the fruit of certain species of citrus, exported from the places where the latter grow, chiefly for the use of manufacturers of citric acid. It is, however, also applied to the natural, not concentrated juice. Of course, properly speaking, "lime juice" should mean the juice of limes, that is, of the fruit of *Citrus Limetta* Risso. And "lemon juice" should denote that of lemons (from *Citrus Limonum* Risso). But the two terms are often used as synonyms. The commercial lime juice is, however, derived from still another source, namely, the bergamot (from *Citrus Bergamia* var. *vulgaris* Risso et Poiteau), and indeed very largely. Of the bergamot, the only salable parts are the essential oil of the rind and the juice. In the case of lemons, those which are used up for the manufacture of the essential oil are, of course, also deprived of their juice. And in the case of limes, the essential oil is of little importance, while the juice is about the only salable part. It is not profitable, however, to

grow limes only for ^{this} purpose, except in a few favored localities. The island of Montserrat (West Indies) is one of the principal localities where the lime is cultivated on a large scale.

No. 2,367.—Phosphorus Paste ("Menthol").

A good phosphorus paste for exterminating rats and other vermin is prepared as follows (after Dieterich):

Phosphorus.....	2 parts.
Beef-tallow.....	8 "
Borax, powd.....	4 "
Lampblack.....	1 part.
Rye Flour.....	35 parts.
Water.....	50 "

Melt the tallow in a capacious capsule, together with the borax and water, and cautiously melt the phosphorus in the mixture. Then add the lampblack and rye flour, and thoroughly incorporate the phosphorus with the mass.

The addition of borax greatly facilitates the distribution of the phosphorus, and at the same time increases the keeping qualities of the mass.

No. 2,368.—Quinine Toothpowder (M. O. B.).

Quinine or one of its salts is occasionally added to tooth-powder combinations, though we fail to see what good it can do in the small proportion in which it is used at a time.

Here is a formula recommended by Dieterich:

Precipitated Carbonate of Calcium.....	20 av. oz.
Orris Root.....	8 "
Sugar of Milk.....	3 "
Saccharin.....	4 grains.
Pumice Stone.....	390 "
Carbonate of Magnesium.....	390 "
Tannic Acid.....	300 "
Hydrochlorate of Quinine.....	80 "
Oil of Rose.....	16 drops.
Oil of Peppermint.....	80 "
Oil of Ylang.....	5 "
Oil of Almonds, essent.....	5 "

No. 2,369.—Bismuth and Potassium Iodide (G. F.).

This reagent, which has been proposed by Mangini as a precipitant for alkaloids (in aqueous solution containing free sulphuric acid), is prepared by dissolving iodide of bismuth in warm concentrated solution of iodide of potassium, and afterwards adding twice as much of the same solution of iodide of potassium as was originally used.

Eau-de-Cologne.

A SHORT time ago the *Chemist and Druggist* announced that a prize—in the shape of a paid trip to the Paris Exhibition—would be awarded to any one who would submit the best sample of self-made eau-de-cologne, together with the formula, the decision being left with a well-known London firm. In compliance with this announcement, two hundred and nineteen samples and formulæ were sent in, and among these the following was awarded the prize:

Oil of Bergamot.....	2 drachms.
" " Lemon.....	1 drachm.
" " Neroli.....	20 drops.
" " Origanum.....	6 "
" " Rosemary.....	20 "
Alcohol, triple-distilled.....	1 pint.
Orange-flower Water.....	1 oz.

[British weights and measures.]

In a subsequent issue of the same journal, the editor makes the following remarks:

"A very good authority states that eau-de-cologne can only be of first quality if it contains oil of lemon and grape spirit. We know also that the cologne-makers—the *Farrinas*—are careful to distil the article, and to keep it for a year in bulk before it is bottled. The presence of neroli is, of course, essential; that is the characteristic odor of the 'water,' all the other essences in it being in the nature of mellowers. There is a universal belief that none of the imitations of the genuine article approach it in delicacy. This is probably due to the fact that the imitations are more charged with essences than the genuine, which is exceedingly weak in everything except spirit. This is where the 'prize formula' scores. Compare it, for example, with *Spiritus odoratus* U. S. Ph.—an official eau-de-cologne—the formula for which is:

Oil of Bergamot.....	16 parts.
" " Lemon.....	8 "
" " Rosemary.....	8 "
" " Lavender Flowers.....	4 "
" " Orange Flowers.....	4 "
Acetic Ether.....	2 "
Water.....	158 "
Alcohol.....	800 "

"Here we have a compound not unlike the 'prize' one, except that the American spirit contains lavender in place of origanum, and acetic ether as a beneficial addition for sick headaches. The U. S. Pharmacopœia errs also in directing the preparation to be filtered, for filtering is fatal to the delicacy of eau-de-cologne. Moreover, the proportion of essences to spirit (about 1 in 25) is much too large,

and it is here that the prize formula has the pull; but even it errs on that point. Ten years ago we [*Chem. and Drugg.*] printed a formula which contained only about 1 part of essence to 70 parts. The product secured a gold medal at the Sidney exhibition next year. This formula was as follows:

Oil of Bergamot.....	7 parts.
" " Citron (<i>Citrus medica</i>).....	17 "
" " Neroli petale.....	10 "
" " " bigarade.....	8 1/2 "
" " Rosemary.....	7 "
Grape Spirit.....	8,000 "

"Although this formula breaks away from the standard in directing oil of citron instead of lavender, it is in this respect that the superiority of the product manifests itself. There are few oils so liable to adulteration as lemon- and even the genuine oil has not the perfuming basis which citron oil possesses, while the latter has the characteristics which make lemon useful in eau-de-cologne. It is necessary to note, too, that the perfume must be derived mainly from the orange family; rosemary is an essential accompaniment, but all other odors, such as musk, civet, and clove, which some are apt to load it with, are injurious to the refreshing character of eau-de-cologne. Origanum is a rare constituent, and we cannot yet say that it is pleasing. It will doubtless tone down by age and give a character which is in no other way obtainable, except perhaps with oil of amber—an odor which develops the strength of the principal essences."

Rapid Reduction of Ferric Salts.

WHEN iron is to be determined volumetrically, it is necessary that all ferric compounds should be reduced to ferrous, for it is only in the latter condition that the effect of oxidation by permanganate or bichromate of potassium can be used as a measure. The reduction of ferric to ferrous salts is accomplished in various ways, generally well known, but all of them somewhat tedious or circumstantial. A very simple method, however, has been proposed by Jones, which permits the reduction to be accomplished by a simple filtration through metallic zinc. The latter should be granular, of such size that it will pass through a sieve having 40 to 60 meshes to the linear inch. About 10 av. oz. of this zinc are packed into a vertical tube, the lower orifice of which is stoppered with a loose pellet of cotton. Before use, some dilute sulphuric acid is passed through the zinc, and immediately afterwards the solution of the ferric salt. The latter, in contact with the metallic zinc, or rather with the nascent hydrogen, is reduced to the ferrous condition, and thus passes out from the tube. It is easy to displace the last traces of it by means of acidulated water.—*J. Soc. Chem. Ind.*

Saccharin as an Antiseptic.

SACCHARIN is regarded by a French writer (*London Lancet*) as a valuable antiseptic. A strength of 1 to 500, as an addition to mucilaginous and other solutions, prevents the formation of low organisms. Thus a valuable, inexpensive dentifrice may be prepared by simply dissolving saccharin in water to the proportion of six per cent. A teaspoonful of this in a half-pint of water forms an admirable antiseptic mouth wash. In cases of malignant or other disease of the stomach, requiring the washing-out of that organ, a solution of saccharin of the strength of two per cent will be found very suitable.—*Chem. and Drugg.*

A Delicate Reaction for Pine-wood Resin.

THE resin is warmed gently with 5 C.c. of glacial acetic acid in a dry test tube, and, after cooling, a drop of concentrated sulphuric acid is allowed to flow down the sides of the tube. As the liquids mix, a coloration varying from bright red to violet is produced. This reaction is specially recommended for testing the size of paper for resin, but may also be used under other circumstances.—*T. MORAWSKI, in Chem. Zeit.; J. Chem. Soc.*

Buffalo College of Pharmacy.—Dr. Ernest Wende has been elected Professor of Botany and Microscopy. Prof. E. V. Stoddard has resigned the chair of *Materia Medica*. He is succeeded by Dr. Eli H. Long. The department of pharmacognosy, heretofore joined to *materia medica*, has been separated from the latter and put in the charge of Mr. John R. Gray. The next course of lectures will begin on October 2d.

Gnomium, the new element which Krüss and Schmidt, of Munich, some time ago announced as accompanying nickel and cobalt, is said by Dr. Fleitmann to be most likely a myth. The latter has had practical experience with both metals, but chiefly nickel, for many years, and has never observed any indications of the presence of a foreign body. It is, however, reported that a further communication by Krüss and Schmidt will soon appear.

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Whole No. 184.

THE COLLECTION AND PRESERVATION OF PLANTS.

(Continued from page 187.)

Preparation of Plants.—As soon as one has returned from a botanical excursion, the first thing he ought to do is prepare the specimens collected. He should never defer this until the following day, unless he wants to see his specimens more or less damaged. In case the thing is impossible, the best thing to do is to leave the plants as they are, in the box, and put the latter in a cool place.

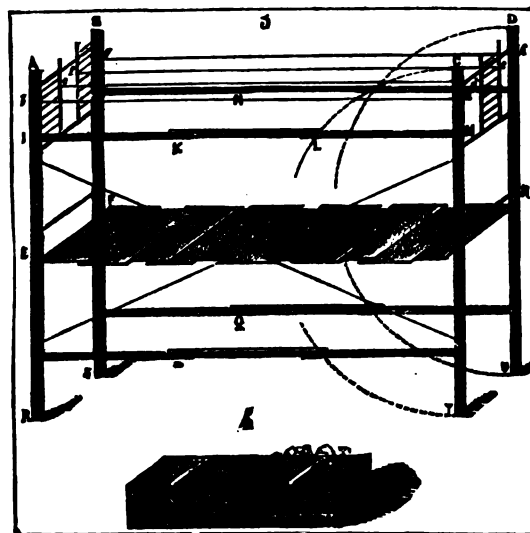
For the preparation of phanerogams and ferns, mosses, and other cryptogams of a more or less dry texture, we proceed as follows: We should have on hand a large quantity of common yellow (straw) paper, which is now preferred to the unsized gray paper formerly used, and which has the advantage over the latter of drying rapidly, because it absorbs humidity less easily. It is of a firmer consistency, too, and this gives the specimens more rigidity. Finally, it is much cheaper, and this is a further consideration. This paper should be of the size that has been adopted for the herbarium. Driers should be prepared beforehand by putting five or six double sheets one within the other.

A package of driers and a package of double sheets are placed on one side and the botanical box on the other. We then take a drier and lay upon it an open double sheet. The plants should be arranged on the latter in

them to so strong a pressure. As the packages are looser, the air circulates between the sheets and removes what humidity remains.

On the first day, the driers should be changed in the morning and evening. On the following days, a single change will suffice.

The desiccation of plants is facilitated by spreading the sheets containing them around in a dry and well-aired place, before putting them under pressure again. In order to hasten the preparation still further, an appara-

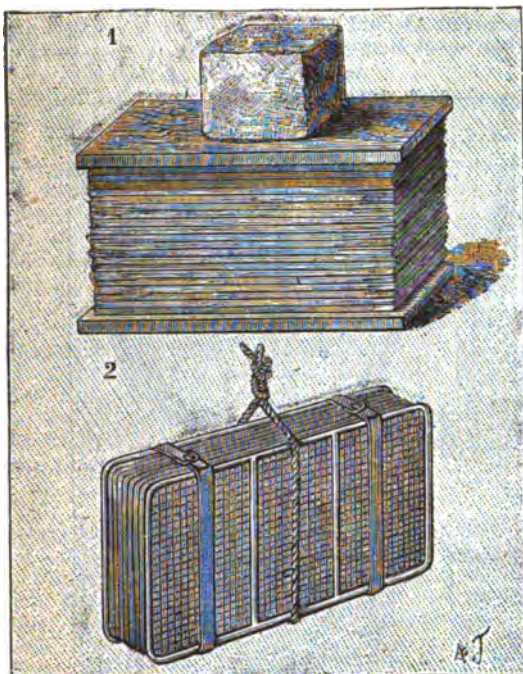


Figs 3 and 4.—Apparatus for Drying Plants.

tus called a wire press (Fig. 2) is used. This is formed simply of two wire gauze frames, between which may be arranged twenty folios without driers, after the plants have been pressed sufficiently to cause them to give up most of the water that they contained. The package is fastened with straps and suspended in the sun or before the fire in a dry and well-aired place. This system gives the best results, provided that too large a number of specimens are not put in each package, in which case those in the centre would get rotten.

The fact must be recalled that plants are so much the better prepared, and better preserve their colors, in proportion as the driers are often changed and the desiccation is more rapid. A specimen is sufficiently dry when it has become rigid and does not feel damp to the touch.

The botanist, on an excursion, is often annoyed by want of a place to make his preparations. The small size of hotel rooms renders it very difficult to spread plants out and to dry damp driers. In the Bulletin of the Botanical



Figs. 1 and 2.—Plant Presses.

such a way that they shall preserve their natural aspect as nearly as possible, and they should not lie over one another.

The specimens should be accompanied with the tickets that were fastened to them in the field. The sheet, having been folded, is covered with a drier, upon which another sheet is to be laid and provided with specimens; then another drier is placed in position, and so on, care being taken to arrange the large specimens alternately from one side to the other, so as to balance the package well. When the latter has reached a height of say 12 inches, boards designed to sustain it are put on top of and beneath it. As many packages are to be made as are necessary to exhaust the gathering. Each package must then be submitted to a strong pressure. For this purpose, presses of different styles have been devised. The simplest method is to load each package with large stones or other heavy objects, which have the advantage of exerting a continuous pressure in measure as the package shrinks.

The next day, the driers, which will have absorbed a portion of the water contained in the plants, are removed from each package and replaced by dry ones, and the packages are again submitted to pressure. In doing this, it is not necessary to touch the specimens. The sheets are used, just as they are, to form new packages, care being taken simply to straighten out the leaves that have become folded. The damp driers are left to dry, so that they can be used over again.

After the plants have parted with most of the water that they contained, it is no longer necessary to submit



Fig. 5.—Manner of Cutting Plants.

Society of France (vol. xxx., 1883), Mr. Vallot has described an apparatus which, to a certain point, permits of obviating this inconvenience (Fig. 3). It is simple and light in construction, and is easily mounted and carried. A package may be made of all the pieces that constitute it, and in this form (Fig. 4) it takes up very little space with the baggage.

The preparation under consideration, as we have described it above, is adapted to small, thin, and easily dried specimens, but there are others that require certain

precautions before putting under pressure. Thus the too thick parts, roots, tubercles, bulbs, etc., should be rendered thin by means of a very sharp knife, care being taken to see that the part that remains sufficiently represents the complete organ (Fig. 5).

Bulbous plants will continue to vegetate in the herbarium, owing to the nutritive materials stored up in their subterranean parts. To prevent this, it is necessary to immerse them for a few minutes in boiling water. An immersion of about twenty minutes in a bath of alcohol or vinegar likewise gives excellent results. For succulent plants, such as *Sedum*, *Sempervivum*, etc., the same precaution is necessary. Specimens that are too large should be divided, and every fragment be dried separately, with one number common to all.

There are fleshy flowers that it is difficult to preserve in a herbarium. Some of these should be detached and preserved in alcohol. The same method is applicable to flowers with a complicated structure, which in this state of preservation are more easily studied. Such is the case with certain orchids.

When the inflorescences are very dense, the flowers cover one another when they are put in the press, and they become black and often finally rot. A good way of preparing such flowers is to detach some of them and dry them separately.

When the inflorescences are too voluminous, as happens with the capitula of certain compositæ, it is indispensable to split them in order to facilitate their desiccation.

Certain plants, such as the grasses, ferns, etc., dry much more rapidly than others. It is necessary on changing the driers to examine the specimens carefully and to remove them in measure as they are found to be in a proper state of dryness. The dried plants are kept in packages until they can be introduced into the herbarium. If one is on an excursion and wishes to ship them, it will be necessary to affix to each one a ticket containing the notes taken in the memorandum book. The plants should be packed in tight boxes, that one should order to be put in a place free from humidity during the trip.

which may be filled with water, and which is affixed to the upper part of the box. After placing a vessel containing a certain quantity of bisulphide of carbon at the bottom of the box, the packages are put in place, each being partially opened so that the vapor disengaged may penetrate everywhere. After the box is closed it should remain so for several days, after which the cover is removed and the packages are exposed to the air until the odor of the sul-

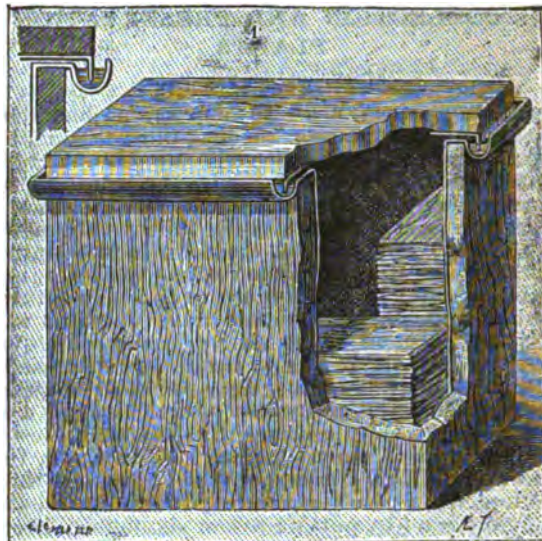


FIG. 6. - Bisulphide-of-Carbon Box.

phide has entirely disappeared. There is a process of preservation which is more generally employed, and which consists in immersing the specimens in the following solution :

75-per-cent Alcohol.....	1 quart
Bichloride of Mercury..	1½ oz.

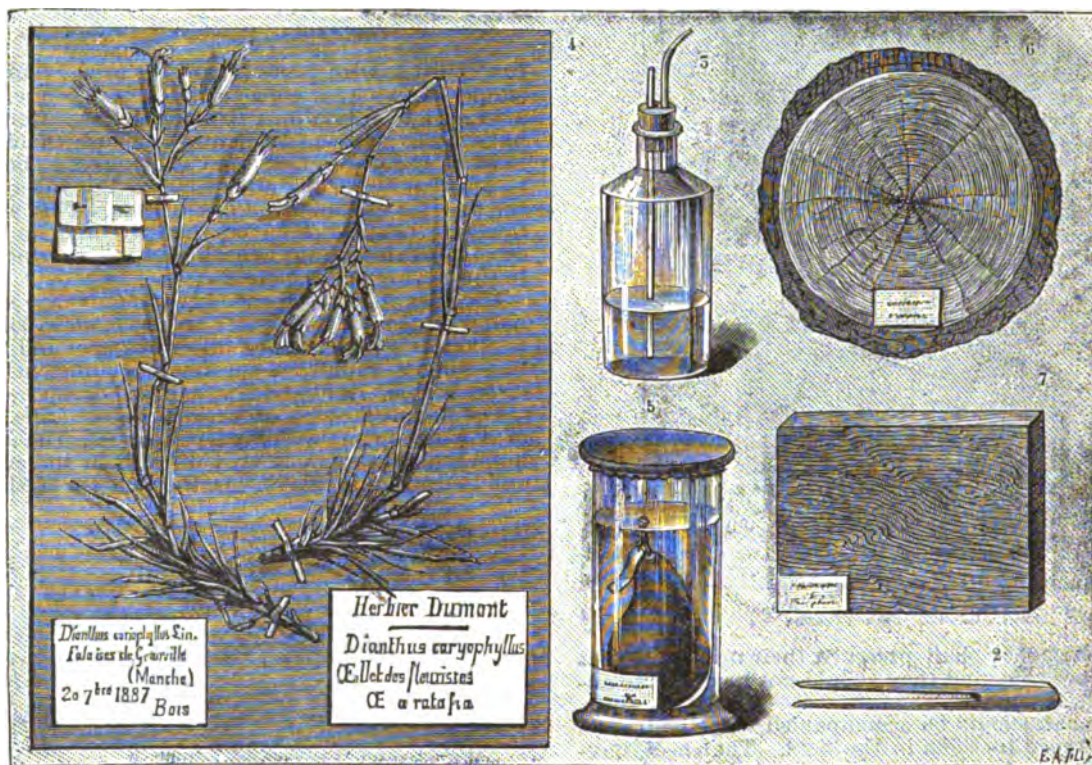


FIG. 7. - Mounting and Marking Specimens.

The ferns, lycopods, horsetails, rhizocarps, mosses, liverworts, lichens, a goodly number of fungi, and the Characeæ are prepared as we have just described. The fleshy fungi that cannot be dried are to be put into alcohol after a colored drawing of them has been made. For the preparation of seaweeds, see the pamphlet by Dr. Bor-net, which we have already spoken of (Sept. number, p. 167).

Dried plants are apt to be destroyed by insects, and large collections would soon become the prey of the larvæ of *Anobium*, *Ptinus*, etc., were not precaution taken to protect them against the attacks of these pests.

Certain persons are content to keep their plants in tightly closed cases in which they place carbolic acid, camphor, or oil of thyme. Others, once or twice a year, place their packages of plants in a box especially constructed for the purpose, and thereon impregnate them with the vapor of bisulphide of carbon. How dangerous it is to handle this substance is well known, and it should be used with great caution. The sulphide box should be lined with zinc, and should be closed hermetically by a well-adjusted cover, whose prominent flange enters a gutter

This liquid is a very violent poison, so the use of it requires great precautions. The following formula is sometimes preferred, because the sublimate preserves its properties more intact :

90-per-cent Alcohol.....	1 quart
Water.....	2½ oz.
Bichloride of Mercury.....	1½ oz.
Chloride of Ammonium.....	½ oz.

The bichloride is dissolved in the alcohol, the chloride of ammonium in the water, and the two solutions are mixed.

The plants are immersed in the liquid as follows : A deep porcelain plate of rectangular form, and a little larger and wider than the herbarium paper, is filled with the solution and placed upon a table between a package of plants to be poisoned and a package of driers. Then the tickets are detached from the first specimen, so that they may not be ruined by a stay in the alcohol, and, as a greater precaution, in order to prevent any soiling contact, they are fixed with pins so that they project externally upon a wrapper. (A good supply of wrappers should be within reach.) This wrapper thus prepared is placed upon a

drier, and then, with wooden or whalebone nippers (Fig. 2, No. 2), the specimens are seized and immersed in the liquid. Nippers made of metal should never be used for this purpose. The form that we figure is the one adopted at the Museum of Natural History, and can be easily made by any one for himself.

After the specimens have remained in the liquid for a short time, they are taken out with the nippers and allowed to drain; then they are placed in the cover, which is closed and covered with a drier. The same operation is performed on the rest of the specimens. As soon as a large enough package has been formed, it is put in a well-aired place, so as to permit of the evaporation of the alcohol. At the end of twenty-four hours it is necessary to replace the damp driers by dry ones. A longer stay in them would blacken the specimens.

It must not be thought that the specimens thus prepared are forever proof against the attack of insects. The herbarium should be often inspected, and a few drops of preservative liquid be thrown upon such specimens as are beginning to be attacked. This operation may be very easily performed with the bottle represented in Fig. 7, No. 3. This is closed with a rubber stopper through which pass two glass tubes, one for the passage of the liquid and the other for the entrance of air.

Certain families of plants are much more sought after than others by insects. As a general thing, fleshy plants and those that contain starch are the first ones eaten; the grasses, ferns, and mosses, on the contrary, are very rarely attacked. After the plants have been poisoned, it only remains to arrange them in the herbarium. To this effect, they are fixed upon simple sheets of strong, sized paper, in such a way that they will hold well. Thus prepared, they are put in wrappers. The mean dimensions of the mounting paper are 12x18 inches.

For fixing the specimens, use is made of small straps of gummed paper arranged here and there in such a way as to hold all the parts, without, however, concealing them (Fig. 7, No. 4). Instead of straps, some persons use pins, but the use of these is more difficult, and they have the drawback of breaking the delicate parts of plants by their contact. The specimens must not be glued to the paper, but should be detachable at will, so that they can be thoroughly examined when necessary. Several species should never be fixed upon the same sheet.

Large specimens, the lichens with their support, and certain fungi can be fixed only upon very strong paper or even upon cardboard, and it is sometimes indispensable to sew them on with cord. In order to prevent them from injuring the neighboring plants in the package, good cushions of soft paper should be interposed. In all cases, sufficient space should be reserved at the bottom of the sheet for the reception of the labels. To the left is placed that of the collector or of the person from whom the specimen was received. This label should always be carefully preserved, for it is the one that must give authority in case of doubt. It should bear the number and the notes taken in the memorandum book. When it is a question of *exsiccati*, that is to say, of collections of which several examples exist, the numbers permit of easily finding the names of the plants when the latter are described and published. To the right is placed a label by itself sufficiently large to allow bibliographic data and observations to be added to the name. The flowers and fragments that become detached during the preparation of the specimens must not be rejected, but should be preserved in small envelopes; and whenever it is desired to make an analysis it is better to use them than to injure one's collection. The sheets filled with specimens are placed in wrappers, and it only remains to classify them by families and put them in packages, which should be arranged in tight cases in a dry place and where the temperature is as equable as possible. Care should be taken to allow nothing to enter the room devoted to the collection that could attract insects, and never to allow plants to enter it that have not first been poisoned. Several sheets on which are mounted species belonging to the same genus may be inclosed in the same wrapper. To the upper right-hand corner of the wrapper should be glued a small, conspicuous ticket bearing the name of the species. This renders researches much easier.

Conspicuous tickets are also used for the genera, but these are fixed upon simple sheets so that they can be easily shifted. They must be very distinct from the preceding. They may, for example, be made longer and of a different color. They are usually affixed to the middle of the sheet. The family ticket should be larger still, and also of another color. It is fixed to the left of a simple sheet.

The herbarium packages should not be too bulky. They are kept between cardboards fastened together with straps.

An excellent measure taken at the herbarium of the Paris Museum consists in placing the species, according to their country, in wrappers bearing labels of various colors corresponding to the five parts of the world. White indicates European species, yellow represents those of Asiatic origin, blue is for Africa, green for America, and red for Oceanica. [There should be another color for plants occurring in two or more of these regions. It is often impossible to decide to which of the several re-

gions a plant should be assigned, if it occurs in several.—Ed. AM. DRUGG.] This arrangement permits of easily finding the species in which one is interested when he is making researches upon the flora of a region. Besides, it shows at a glance the geographical distribution of each species, genus, and family.

Fruits are, of course, a necessary complement of any herbarium. If they are fleshy and contain any notable amount of water, they may be preserved by placing them in a jar and covering them with diluted alcohol, which must be changed several times until it remains transparent and becomes only slightly colored. Dry fruits are simply put into bottles, boxes, jars, or paper bags. In the case of small fruits, it is best to fasten the paper bag containing them upon the same paper on which the corresponding dried plant is mounted.

Specimens of woods usually require a separate room or case. As they often contain insects' eggs, they require to be put from time to time into the bisulphide-of-carbon box.—D. Bois, in *La Nature* (after *Sci. Amer. Suppl.*).

Podophyllum Emodi (Wallich).

SOME time ago the announcement was made that the "American species of podophyllum" was met with in some sections of the Himalaya in such abundance, and that it was there so much richer in resin, that the chief supply of "podophyllin" was in the future likely to be derived from India. There is evidently some mistake here, since the American *Podophyllum peltatum* has never been met with by botanists in the East Indies. It is more than probable that the East Indian species, *Podophyllum Emodi* Wallich, was the plant intended to be referred to. According to Dymock, the root of this species appears, indeed, to contain a large amount of resin having apparently the same purgative properties as that derived from the American May apple.

The following account of the East Indian species is taken from the new "Pharmacographia Indica," by Dymock, Warden & Hooper, the first part of which has just reached us:

Podophyllum Emodi Wall.

Fig.—Jacq. Voy. Bot. II., t. g.

Hab.—Interior ranges of the Himalaya, Sikkim, Hazara, Cashmere.

Vernacular Names.—Pápra or Pápri, Bhavan-bakra or Bakra, Chimyaka (*Hind.*).

History, Uses, etc.—The genus *Podophyllum* contains four known species, one Himalayan, one American, and two Chinese. The Indian species inhabits shady valleys in the inner ranges of the Himalaya, and is very abundant in Kunawur and Cashmere. The remarkable appearance of its bright red fruit would lead one to suppose that it must have attracted the attention of the Hindus, and, judging by the Hindi names *Pápra* and *Bhavan-bakra*, it is probable that it was one of the bile-expelling plants described by Sanskrit writers under the name of *Parpata* and its synonym *Vakra*. In Hindi the Sanskrit *parpata* becomes *papra*, and *vakra* changes into *bakra*; the prefix *bhavan* probably means "hill," and the Hindi name would thus signify "hill *vakra*," as distinguished from *kshetra-vakra* or *kshetra-parpata*, field *vakra* or *parpata*, a name applied to one or more species of *Oldenlandia*. The modern medical literature of India contains hardly any information about this plant. A specimen of the root was forwarded to the committee for investigating Bengal drugs by Dr. Falconer about fifty years ago, but no examination of it appears to have been made. The plant is mentioned in the *Pharmacopœia* of India as a possible source of podophyllin, and Stewart says that the fruit is used medicinally in Lahoul.

Description.—Stem or scape 6 to 12 inches, erect, stout, herbaceous; leaves 2, vernal, alternate, long-petioled, plaited and deflexed in vernal, 6 to 10 inches in diameter, orbicular, 3 to 5 lobed to the middle or base; lobes cuneate, accurately serrate; peduncle terminal in bud, then apparently supra-axillary or inserted on the petiole of the upper leaf; flowers 1 to 1½ inches in diameter; sepals very deciduous; petals 6, sometimes 4 (*Royle*), obovate-oblong; berry 1 to 2 inches long, ellipsoid, red (*Fl. Br. Ind.*). The root agrees with that of *P. peltatum* in most particulars, but differs in the intervals of the knots whence the aerial stems are given off. The rhizome is more or less cylindrical, crowded above with tuberosities, marked by depressed oval or circular scars, and giving off numerous simple rootlets below. The terminal bud is inclosed in whitish papery sheaths. The color is yellowish-brown, paler in the rootlets. The fracture is short and mealy, disclosing a white section, with a circular arrangement of yellow vascular bundles, and bounded on the outside by a thin brown cortical layer.

Chemical Composition.—The powdered root was macerated in rectified spirit for four days, and the tincture, evaporated to dryness, weighed 25 per cent of the drug. This extract was well washed with water, which removed sugar and bitter coloring matter to the extent of 15 per cent. The remaining 10 per cent of resin or resins was dried at a low temperature and had a bright brownish-yellow color. The reactions of the resin with tests, and its solubility in chloroform, ether, and diluted alkalis,

were very similar to those of the officinal resin of *P. pelatum*.

Half a grain (0.35 Gm.) taken in the evening produced unmistakably a cathartic action the first thing next morning. A slight griping was experienced.

The Reihlen Champagne Process.

CHAMPAGNE, as is well known, is but an ordinary wine charged with carbonic acid gas. The Germans call it "foam wine" (Schwaumwein). The old French province from which it borrows the name that we give it still raises the grapes, the yield of which was first subjected to the champagne process—this process having been followed since about the year 1700. As long ago as 1826, Kessler, in Esslingen, Württemberg, made a modest beginning in the manufacture, with success so encouraging that there are said now to be in Germany as many as sixty establishments of the kind. This old process is exacting in the extreme as respects time, labor, and careful and skilful manipulation. It begins late in the spring with the wine of the preceding autumn. In such wine, the fungi, constituting the yeasty principle (pilz), are still alive and vigorous enough, upon due provocation, to set themselves at work again at their proper function of fermentation. Older wine, it has been held, could not be employed, because these vegetable germs had, it was thought, become sterilized. About 2 per cent of sugar having been put into the bottles, they are recorked. Fermentation sets in, the products being alcohol and the agent of effervescence or sparkling, namely, carbonic acid gas. But there is a further product, or a residuum, that is to the manufacturer by no means so welcome. There is at first a muddying of the wine as a whole, and then a thick deposit upon the sides of the bottle. Here begins the real labor, involving the handling of each bottle from one to two hundred times. Tannin and alum are introduced to loosen this deposit from the walls of the bottles, which are then set in a position more and more inclined until at last they are quite inverted and the whole of the matter which it is desired to eliminate is gathered on and around the cork. All this is attended with the loss of from 15 to perhaps 25 per cent of the bottles and their contents, so great and uncontrollable does the pressure become. The corks having been drawn to clear the necks of the bottles of the objectionable deposit, and to replace with sugar, cognac, and strong wine what is necessarily withdrawn in this wasteful process, the champagne is recorked and is ready to be put upon the market.

Such, for more than three half-centuries, has been the course of procedure in converting a still wine into a champagne. Any calculation of the amount of labor and material which it involved, as against what has since proved to have been all along practicable, would appear wild in proportion to its approximation to the truth. Several years ago Mr. Adolph Reihlen, of Stuttgart, turned his thoughts to the subject, and soon reached the conclusion that there must be some way of reducing this labor and suppressing this waste. But between this conclusion and the consummation of his scheme there lay a road so long and so beset with difficulties that could he have anticipated them it is doubtful whether he would have had the courage to hold on his way. That road lay right athwart some of the most positive, or rather most negative, dogmas of the chemistry of fermentation as it had all along been taught in the schools, as, indeed, it was held to have been demonstrated over and over again. He resolved to strike for independence of the germs that might chance to be in the wine to be dealt with. He made up his mind, as the result of countless experiments, that to introduce such germs from without was but a matter of method—of mere mechanical appliance. So high an authority as Pasteur pronounced his scheme visionary, but Herr Reihlen was too sure of his footing in the very principles that were quoted against him to be willing to yield.

A detail of the chemistry and mechanics involved in the Reihlen process would be out of place here, but a few words upon the general line of investigation and experiment which he pursued may be of interest.

In 1833, according to the *Allgemeine Zeitung* article above referred to, Schwamm discovered that the deposit thrown down by wine contained countless parasitical plants of various orders and almost inconceivably minute. These were recognized as the agent in fermentation, whatever else is essential thereto being but the food upon which these subsist. Reihlen, however, discovered that these necessary organisms are by no means confined to this domain, but that they exist throughout the whole vegetable kingdom, and that they can be induced to settle down from the air upon vegetable fibre suitably prepared. So fell to the ground the theory that the wine itself must furnish the principle for its own fermentation; it is possible, theoretically at least, to furnish it from without. The materialization of this theory into a working apparatus constitutes a long and, in parts, almost thrillingly interesting chapter in Herr Reihlen's biography. This apparatus is such that large quantities of wine in one body can be subjected to the fermentation process under the impulse of the germs caught, as it were, from the atmosphere, upon wood fibre moistened with sugared water. This fibre is not thrown loosely into the receiver, but is held in a sort

of basket, so that it can be withdrawn at pleasure, and with it the sedimentary matter which in the usual process gives so much trouble. There being a fixed ratio, of course, between the pressure upon the receiver and the advance of the champagne process, it is easy to determine how rapidly the contents can be drawn off as a finished product, and the equivalent of the raw material, simple wine and sugar, added to make the process a continuous one. This may go on in one vessel for weeks; how many I do not know, nor can I say exactly what sets the limit.

It was in 1885 that the first bottle of this new champagne was sold. The production has increased from the 600 bottles of that year to something like 6,000 bottles a day. Thus far it has been impossible for the manufacturers to keep up with their orders. Of this the account is easy. A champagne indistinguishable by the most practised taste from the best French brands—so it is claimed as the result of experiment—is furnished at less than 30 cents a bottle, about \$1.50 a gallon. Indeed, it is found that the conversion into champagne need not add more than 20 or 30 per cent to the cost of the wine, though, of course, in such computations much depends upon the style in which the article is presented to the public.

But cheapness is but a secondary consideration when it comes to dealing with medical requisites. From the first the new champagne has been put into use in the hospitals of this city and elsewhere, and has called forth the most pronounced testimony to its purity and medicinal virtues from such authorities as Obermedicinalrath Dr. von Landenberger, of this city; Geheimrath Dr. von Pettenkofer, of Munich, and Prof. Dr. Kussmaul, of Strassburg.—*Report of U. S. Consul EDWARD P. CRANE, of Stuttgart.*

(ORIGINAL COMMUNICATION.)

THE LITTLE OLD DRUGGIST.

BY J. B. NAYLOR, M.D.

THERE's a little old druggist just out the way,
In a long and dimly lighted room,
And he compounds and mixes and filters all day—
Though his step is slow and his hair is gray;
And he looks like a ghost in a gilded tomb,
Till a chemical change seems wrought in himself,
And he looks as dry as the drugs on his shelf.

His hair is as white as his calomel,
His teeth are as yellow as golden seal;
Perhaps he chews—it is hard to tell,
For if he does he conceals it well;
And his skin is the color of orange peel,
While his eyes have a vacant and glassy stare,
And his brow is wrinkled and drawn with care.

He talks in a piping, childish voice
Of the druggists whom he knew in his youth;
Of the drugs they obtained so rare and choice,
Of the handsome profits that made them rejoice—
For he never departs from the truth;
And as memory recalls those halcyon days,
A chilly smile o'er his countenance plays.

Yet he never utters a vain regret
For days that can ne'er return;
"If you don't get what you want,
You must want what you get,
For if you'd all you desired,
You'd lack something yet,"
Is an adage, he says, he has learned.
So among the thorns he plucks the flowers,
This wrinkled but jolly old druggist of ours.

PEBBLEVILLE, O., August 24th, 1889.

Industrial Uses of Hydrogen Peroxide.

HYDROGEN peroxide is now employed for bleaching silk, feathers, hair, ivory, bones, bristles, etc., and will doubtless soon be used for bleaching wool, and, if it was cheaper, even cotton.

For bleaching delicate materials, such as wool, feathers, etc., it should not be too strong; a solution of 1 in 10 is strong enough, and a bleaching vat of this solution may be used for quite a long time, if the strength be kept up by fresh additions of hydrogen peroxide. The purer the peroxide is the better it will work, and care should be taken to avoid the presence of things which decompose it and, of course, render it useless, such as metals, even a nail, iron rust, etc. The strength of a solution is very easily estimated by titration with permanganate. As a general disinfectant it is not convenient, but is suitable for distribution as spray in sick-rooms.—C. F. GÖHRING in *Chem. Zeit.* and *J. S. Chem. Ind.*

Tooth Powders.—Deschamps gives two formulas in the *Rev. de Thérap.* of September 1st:

Acid.	Alkaline.
Venetian talc..... 3 iv.	Venetian talc..... 3 iv.
Cream of Tartar..... 3 i.	Bicarbonate of Sodium, 3 i.
Carmine..... gr. v.	Carmine..... gr. v.
Essence of Menthol... gtt. xv.	Essence of Menthol... gtt. xv.

ART OF DISPENSING.

(Continued from page 154.)

GRANULES—DRAGEES.

GRANULES, *granula*, were first introduced to the profession in France, and consist of pills made of sugar, each containing a definite quantity of a powerful medicinal substance, or else small pills of about 0.05 Gm. (almost one grain) in weight and coated with sugar. The manufacture of dragees is practicable only on a large scale, but still a skilful dispenser may cover small quantities of pills. Both the smell and taste of the pills are concealed by this process.

They are prepared from little globules of sugar, small sugar pills, or comfits of poppy-seeds, of which a definite amount by weight is to be taken, moistened with a definite solution of some powerful medicinal substance, the quantity being carefully calculated in proportion to the number of granules, which are then dried and sent to the confectioner, who covers the pellets with sugar and starch (sometimes tinged with cochineal), so that they attain the size of pills about 1½ grains in weight, and which furthermore are sometimes coated with silver-leaf. Thus the preparation of granules is usually practicable only in the manufacture in quantities.

In case a few only of these granules should be needed, the required number of sugar pellets may be saturated with the medicinal substance, and dried and sugared as described previously.

GRANULIDS, in French *granuloïdes*, are large granules or small dragees which are prepared in like manner as granules, or given a spheroidal form.

DRAGEES, *Trageæ* or *Tragemata*, are of an oblong or spheroidal form, and of a correspondingly shaped mass of any composition of bolus or pill consistence, as a kernel. The covering of this kernel is a smooth, white or colored layer of sugar prepared by confectioners by a process resembling that of making granules.

Their weight varies between 0.5 and 2.5 Gm. (8 to 40 grains). In reality dragees are nothing but sugar-coated boli.

BOLUS.

The BOLUS is prepared from a mixture that is rather more plastic than a pill mass. Its weight for administration to adults varies from 0.25 Gm. (4 grains) to 5.0 Gm. (80 grains). This form of medicine is employed by physicians only when the dose of badly-tasting medicine is very large, and it is not desirable for the patient to swallow a great many pills at a time. The small bolus is made into a spherical (pill) shape, the large one in that of a spheroid.

The mode of mixing or preparing the mass from which



the bolus is made is similar to that described for making pills. It should be of a pliable consistence, so that the bolus may be shaped into spheres by the fingers. The prescription specifies the number of boli desired. The separation is effected by means of the pill machine. In case the prescription does not designate the conspergent, *lycopodium* is employed for the colored boli, and *starch* for the white ones.

TROCHES—PASTILLES.

TROCHES or PASTILLES are small round cakes weighing, ordinarily, about 15 grains. When a physician prescribes troches, they are dispensed when only partially dried, while, when they are intended to be kept in stock for a long time, they should be perfectly dried. The process of drying is carried on in a moderately warm place. The

time required for the production of from ten to thirty troches, including drying, is about two hours.

The preparation of the mass for troches or pastilles, according to the prescription of a physician, was formerly accomplished, and would to-day be accomplished if the necessary apparatus were not at hand, as follows: The mass from which the troches are to be made is given the consistence of bolus.

Every 250 parts of the powdered mixture, if it does not contain any viscous matters, must receive an addition of not more than 1 part of finely powdered tragacanth, or 5 parts of marshmallow root. Should more be used, the troches would be too hard when dried. The division of the mass is effected by means of the pill machine, being rubbed into what is termed a pill string, which is cut off between the grooved halves of the pill machine under pressure. The pieces thus cut off are then trimmed with a knife, formed into pills, consperged, and pressed tolerably flat with a cork which has been notched on its smooth surface into a lattice-work or star-shaped device. A troche stamp of metal, with a wooden handle, shaped like an ordinary letter-sealing tool, engraved with a star-shaped device, is also used. The rim of the troche is rounded, but the larger ones, especially when the mass was not of sufficient plasticity, are apt to be more or less notched or cracked, which of course is to be avoided as far as possible.

There are two kinds of pastilles, distinguished by their preparation and composition. In one kind sugar is the constituent, and in the other chocolate (*Semina Cacao præparata*).

PASTILLES with SUGAR. The mass for these is prepared

by thoroughly triturating and mixing the drug employed with a portion of the sugar, and also with the powder that serves as the constituent, and after the whole powdered mass has been thoroughly mixed, adding cold water gradually, with continuous kneading, until a plastic mass is obtained. Tragacanth is generally used as the constituent, and gum arabic, marshmallow, and white of egg are also frequently employed.

The addition

of a mixture of 1 part tragacanth and 2 parts gum arabic will render the pastilles attractive in appearance. A further condition to be observed is that very finely powdered sugar should be used. It is necessary to be cautious in adding the tragacanth, since it has a tendency to make the outside of the pastilles too hard when employed in excess. The pastilles, when dried, should be only so hard as to be easily crushed between the teeth.

Although a perfectly satisfactory pastille mass which dries easily and is also sufficiently hard can be made from 100.0 Gm. of powdered sugar (see below) and 8.0 Gm. glycerinated water, still a trifling addition of powdered tragacanth (say 0.1–0.2 to 100.0 of powdered sugar) is recommendable, since the mass is thereby rendered more conveniently plastic. In this case, each 0.1 Gm. of tragacanth will require 0.5 Gm. more of glycerinated water. Although it is true that glycerin is a hygroscopic substance, yet, in this case, experience shows that it does not impede drying of the pastille mass; the pastilles having been dried for several hours in air at the ordinary temperature, and then in a heat of about 25° C., without undergoing any alteration.

The *Pharmacopœia Germanica*, ed. I., directs that the powdered sugar should be moistened with diluted alcohol, and the pastilles made under pressure. For a pastille mass made in this way, 100.0 parts of powdered sugar and 10.0–11.0 parts of dilute alcohol are required, but the mass has not sufficient coherence and plasticity, and too easily adheres to whatever it may rest upon. By the addition of glycerinated water and some tragacanth, a mass is obtained which neither adheres to the tool with which it is pressed, nor clings to the apparatus with which it comes into contact. The appearance of the pastilles is always improved when no addition of conspergent powder (starch or lycopodium) is made in their manufacture. *Aqua gly-*

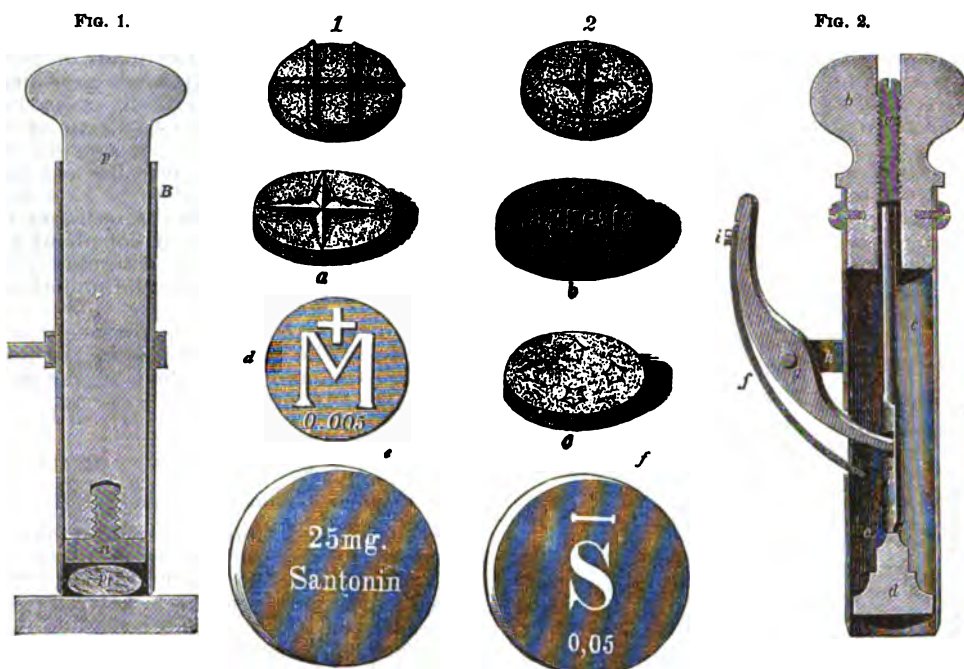


FIG. 1.—Vertical section of pastille-maker; a, cylinder with handle; p, pestle; st, stamp; pt, pastille mass. 1, Troche stamped with a cork notched in lattice work. 2, Troche stamped with a troche stamp. Pastilles punched with the pastille-maker; a and c are pastilles made of sugar, b is a pastille of chocolate; d, mark for pastilles of morphine; e, f, pastilles of santonin. FIG. 2.—Pastille-maker with spring and adjustable screw.

cerinata, or glycerinated water, consists of equal parts glycerin and water.

In preparing a pill mass in which sugar is the constituent, about $\frac{1}{4}$ of the quantity of sugar is taken and the necessary amount of water added. Then by diligent kneading with the pestle, it is made into a mass from which pastilles can be shaped, and the rest of the sugar is added with continued kneading. At first the mass is crumbly, but as the kneading proceeds it will, partly in consequence of deliquescence of part of the sugar, become soft, often too soft, so that it will be necessary to add more powdered sugar to obtain the proper consistence for a pastille mass. Thus the labor may be reduced by employing the greater part of the sugar in making the mixture into a soft pastille mass, and then adding the rest of the sugar. Since the pastille mass containing sugar crumbles after lying for five or ten minutes, and has to be made plastic again by further kneading, it is recommended that the quantities that are to be made into pastilles be carefully weighed and divided by weight (and not by being divided by the pill machine). The manner of making sugar pastilles varies considerably according as a larger or smaller number is desired.

If but few (from 10-50 pastilles) are to be made, or if the drug employed is a very active one, so that the dose must be accurately determined, the following procedure is adopted: The pastille mass, rendered perfectly plastic by having been kneaded with the pestle, as described in the making of troches, is made into portions with a pastille divider, or, if this is not at hand, with a pill machine, and each portion from which a pastille is to be made is shaped into a pill and thrown into the cylinder of the pastille maker, which is made of white metal, brass, or German silver (c), open at the top and bottom, and then flattened by means of the wooden pestle (p), either by sufficient pressure or by moderate blows. A piece of stout paraffin paper forms a suitable foundation for the pastille to rest on.

Conspergents are used only when the mass is sticky or adhesive. Then the bottom of the cylinder must also be dipped into the powder before the making of each pastille. If, despite this precaution, some of the mass should adhere, it must be at once removed by wiping with a cloth.



Rolling Board for Pastilles.

The pestle (p), which may be made of any hard wood, must not fit so closely into the cylinder as to prevent the escape of the air upwards when it is forced down. Furthermore, as it is customary to impress a device or the name of the maker on the pastille, the lower end of the pestle is furnished with a female-screw thread, in which the stamp (st) (made of boxwood or metal) may be inserted.

The pastille divider is made from hard wood of the form and size of the cutter or divider of the pill machine, except that its ridges are 1 centimeter apart.

In the preparation of a large quantity of pastille mass, a rolling apparatus is used, consisting of a rolling board and rolling pin (see the above cut).

The ROLLING BOARD (b) is about 20 Cm. (8 inches) broad, 30 Cm. (14 inches) long, and 3 Cm. (1 $\frac{1}{4}$ inches) thick, made of hard wood, and perfectly even and smooth. Along both the long sides two ledges are fastened, which reach beyond the surface of the board about 2.75 Mm. (ab. $\frac{1}{4}$ inch) above the upper and 3.5 Mm. (ab. $\frac{1}{4}$ inch) above the lower side. The rolling pin is made of the same wood, about 7.5 Cm. (3 inches) in diameter and 25 to 26 Cm. (ab. 10 inches) long. The pin revolves around an axis, of which one end is fastened and the other has a handle which can be unscrewed.

After the dried board has been well sprinkled or dusted with the conspergent powder, a portion of the pastille mass is cut off, made into a cake, and flattened with the hand, dusted with conspergent powder, and spread out with the rolling pin into a uniform mass. As the ledges on the sides of the board offer a resistance to the pressure of the rolling pin, the thickness of the layer of the pastille mass is necessarily equal throughout. The surface of the mass is now again to be sprinkled with conspergent powder, which is rubbed over with the palm of the hand, and the mass is then punched out with the pastille maker. If it is not desired to make the pastilles with a device or the

name of the maker, the pestle of the pastille maker is removed and the punching process continued, without shaking out the pastilles which may be adhering to the sides of the cylinder, until the latter is filled. This, of course, is only practicable when a conspergent powder is employed in the process.

PASTILLE MAKER with spring and adjustable screw. This instrument varies in size and circumference. It differs from the simple pastille maker in that, by means of it, pastilles can be punched out, of any desired definite weight and thickness, and the use of the rolling board with side ledges dispensed with. The pastille mass is spread out on any smooth, powdered surface, such as a slab of marble or a board, by means of the rolling pin, to a thickness slightly in excess of that which the pastilles are to have. The mass is then punched by the pastille maker, and the lever on the side being pressed, the pastilles are thrown out and laid on a plate to dry. The pastille maker consists of a cylinder of plated copper, c.c. surmounted by a wooden knob, b, fastened to it by means of two little screws. The knob b is bored lengthwise through its centre, and the aperture closed with an adjustable screw a. According as this adjustable screw is moved up or down, the play of the stamp e d is determined, and the space below the stamp which is to be filled by the pastille is likewise thus regulated. The spring f causes the lever g to force the stamp e d upwards against the adjustable screw a. On the other hand, if the lever g i, at the point i, is pressed toward the knob b, the stamp is pushed downwards, and the pastilles which have been pushed out are forced out of the bottom of the cylinder. In using this instrument, it is necessary to wipe off the lower end frequently, and dip it into the conspergent powder during the process of cutting the pastilles.

THE DRYING OF PASTILLES made of powdered sugar requires care. The freshly made pastilles are first to be dried for at least an hour at the ordinary temperature of the air, and then exposed to a heat of about 25°. After the lapse of an hour, they are usually dry enough to be dispensed. Thus 10 to 50 pastilles can be made up in two hours. Pastilles intended to be kept in stock should be dried for an entire day at the ordinary temperature, and then placed in a temperature of about 25°, in which they usually dry thoroughly in several hours. A higher temperature frequently injures the smooth appearance of the pastilles.

SIZE OF PASTILLES. If the prescription leaves the determination of the weight or size of the pastilles to the dispenser, he should make them of the weight of about 1.0 Gm. (15 $\frac{1}{4}$ or 16 grains).

B Calomelanos... 1.0
Sacchari..... q.s.
M. f. pastilli 20. D. S.
B Pastillor. Calomelanos num. 20. D. S. (āā 0.05 = $\frac{1}{4}$ gr.).

In this prescription the dispenser has to make pastilles of about 1.0 Gm. weight, from 1.0 Gm. of calomel, 17.5 Gm. (4 $\frac{1}{4}$ 3) powdered sugar, 0.1 to 0.2 Gm. (2-4 gr.) powdered tragacanth, and 1.7 to 1.8 Gm. (ab. 25 grains) *aqua glycerinata*.

CONSPERGENT POWDER for pastilles. If the pastilles are colored, lycopodium is generally used, also a mixture of lycopodium with very finely powdered cinnamon. For colorless or white pastilles, fine, thoroughly dried wheat-starch powder is generally employed, or even a very fine powder of *talcum venetum*.

PASTILLES OF CACAO MASS (*chocolate mass*) are prepared by triturating the medicinal substance with from ten to twenty times its quantity of cacao mass until it becomes a fine powder, and adding to the mixture the remainder of the cacao mass, rendered semi-fluid in the water-bath. The mass, half cooled, or at a temperature of about 40°, is then treated by the pastille divider and the pastille maker in the same manner as the pastilles of sugar. Compounds which are prone to decompose, as well as very bitter or nauseous substances, and especially alkaline salts or earths, are usually made up in pastilles of cacao. Alkaline substances produce changes in sugar, and well dried pastilles containing them become soft or tough on being kept. A limited number of pastilles, which would be used up by the patient in two or three days, may, however, be made with sugar.

BACILLULA.

BACILLULA are a new form of medicine which have made their appearance in some places. They have the appear-



Bacillula of Various Sizes.

ance of small, nearly cylindrical rods, and in their composition, preparation, and consistence they bear a close resemblance to pastilles, except that there is less of detail in their preparation, which is easily and more quickly

attained with the help of a pill machine. Bacillula are made from 0.3 to 0.6 Gm. (4-9 grains) in weight, and from 1.0 to 1.5 Cm. ($\frac{1}{4}$ - $\frac{1}{2}$ inch) in length. Bacillula are given in cases where the patient has a repugnance to pastilles, or when the physician wishes to administer a medicine of small volume or in a different form.

The division of the mass from which bacillula are made is done by means of the pill machine in precisely the same manner as that employed for pills, except that the pill strand is not formed into pills, but only cut into pieces and each portion rolled lightly under the middle finger on the board of the pill machine, in the direction of its long axis, so that the somewhat rough places at which the pieces were attached to each other are to some extent smoothed off. Bacillula are consperged with lycopodium if no other is prescribed.

The bacillula, when finished, are allowed to dry for an hour at the ordinary temperature, and then for half an hour in a moderately warm place. The manufacture of from 20 to 50 bacillula requires about two hours.

SUGAR GLOBULES—SUGAR LOZENGES.

SUGAR GLOBULES, SUGAR LOZENGES, *Rotula Sacchari*, are white cakes, each about one centimeter in thickness, in the shape of segments of a sphere, which, when saturated



Sugar Globules. A, Side View. B, Upper Surface.

with oil of peppermint, constitute the favorite peppermint lozenges. The physician sometimes selects them to administer an ethereal oil or some medicinal fluid in small doses. Should this fluid be of small quantity in comparison with the number of sugar lozenges, it must be diluted with several times its bulk of absolute alcohol, and the sugar lozenges saturated with the mixture as the Pharmacopœia Germanica prescribes for the preparation of *rotula menthae piperita*.

R *Rotularum Sacchari*..... 20.0
Olei Anisi,
Olei Fœniculi..... 55 gtt. 20

or with the intervention of alcohol :

R *Rotularum Sacchari*..... 20.0
Olei Anisi,
Olei Fœniculi..... 55 gtt. 20
Spiritus Absoluti..... gtt. 30

(To be continued.)

The Source of Jamaica Sarsaparilla.

THE uncertainty existing as to the species of *Smilax* which is cultivated in Jamaica has been somewhat cleared up recently by Sir Joseph Hooker, who has carefully gone over all the available information on the subject, and has just published his conclusions. While admitting the vagueness and uncertainty of the information possessed on the subject, Flückiger and Hanbury in the "Pharmacographia" incline to believe that the sarsaparilla cultivated in the island of Jamaica, though of a light brown color and more amylaceous than the Jamaica sarsaparilla of commerce, is botanically identical with it. Specimens of this cultivated plant, but without flowers or fruit, which were sent to Flückiger and Hanbury and planted in the Botanical Gardens at Kew, some twenty years since, have quite recently flowered for the first time, and it is this occurrence which has attracted Sir Joseph Hooker's attention to the subject. The latter authority has, after an examination of these flowers and all the available information, concluded that the specimen in question is not the *Smilax officinalis* H. B. K., and has, therefore, described it anew under the name *Smilax ornata* Hook. f., believing it to be probably identical with the *Smilax ornata* Lemaire, described in "Illustrations Horticoles." The real difficulty which exists as to the placing of the specimens of *Smilax* in regard to their species lies in the fact that, the flowers being dioecious, it is necessary to obtain both a male and a female plant in order to be perfectly accurate in the description. The plant which flowered in the Kew Gardens proved to be a male, the female flowers being still unknown.—*Chem. and Drugg.*

Ice in the Sick-room.—A saucerful of shaved ice, says the *New York Medical Times*, may be preserved for twenty-four hours with the thermometer in the room at 90° F., if the following precautions are observed: Put the saucer containing the ice in a soup plate and cover it with another. Place the soup plates thus arranged on a good heavy pillow, pressing the pillows so that the plates are completely imbedded in them. An old jack plane set deep is a most excellent thing with which to shave ice. It should be turned bottom upward, and the ice shoved backward and forward over the cutter.

IMPROVED VAPOR AND DRAUGHT CHAMBER.

PROF. CLEMENS WINKLER has introduced, in his laboratory, a series of improved vapor and draught closets, one of which is here illustrated and described (after *Berichte*, 1888, 3, 563).

The closets are built against a wall lined with tiles, and into which are built draught-holes communicating with the large chimney. In front of each draught-hole (an elongated rectangular opening) is placed a water-bath of the usual cast-iron style, supplied with an automatic water regulator, placed in front where its action can always be properly watched. The regulator has two descending tubes, one for the influx of water, and the other for the overflow. The latter, being of glass, has a bulb, which enables the operator to better observe the rate of flow. This latter must be so regulated that only a very small quantity of water actually flows off.

Behind the water-baths, and surrounding the rectangular opening in the wall, are projecting tile-shelves, and supports with a movable cover. The latter is shown behind the middle water-bath (see cut) as turned up and leaning against the wall. In the left-hand water-bath, it will be seen that the tile-cover has been tilted over, so that the flap of it is directly over the capsule on the water-bath, thus insuring a better draught. The latter may be still more increased by introducing a small burner in a suitable part of the chimney. Each water-bath is heated by a Bunsen burner. Water and gas are controlled by



Winkler's Vapor Chamber.

stop-cocks placed outside of the closets, and the water-cock is so arranged that it cannot be opened further than is necessary to furnish an amount of water which can be carried off by the overflow. Each closet is, besides, provided with a separate opening near the top, which can be kept closed as long as the draught through the rectangular slit and chimney is operative, but may be opened when additional outlet for vapors is wanted.

Examination of Vermicelli, etc., for Foreign Colors.—100 Gm. of the sample are dried, powdered, treated with 200 Gm. of alcohol for twenty-four to thirty-six hours, and the filtrate is concentrated to 10 C.c. If saffron is present, the extract is yellow and has an odor of saffron. The yellow coloring matter of safflower does not dissolve in alcohol. The yellow of turmeric is taken up by alcohol, and the extract smells of turmeric. Coal-tar colors dissolve in alcohol, and can be extracted from the concentrated aqueous residue by amyl alcohol. If Martin's yellow is present, the aqueous extract is decolorized by hydrochloric acid and the yellow color is restored on neutralizing with ammonia.

Sam Jones on the Faith Cure.—In a recent sermon Sam Jones delivered himself as follows concerning the faith-cure brethren: "I'll tell you where this faith cure comes in. There's an old brother and sister who have been taking all the nasty quack patent medicines on the market for the past two years. Somebody comes along and prays over 'em, and they quit using patent medicines, and they are well again. They say it was faith that cured. It was faith. It was the faith which caused them to quit taking old patent nostrums which cured them."

Separation of Morphine in Forensic Investigations.

BY D. H. DIXON, PH.G., OF OMAHA, NEB.

In the determination of organic poisons in portions of a cadaver, articles of food, etc., the difficulty has to be contended with that with the isolation of the poison, coloring matters and other constituents of the subject under examination are at the same time isolated and interfere with the reactions.

This is especially the case with morphine, which is usually extracted by means of warm amylic alcohol, this, indeed, being best adapted to the purpose, but at the same time taking up many impurities. Since morphine is abstracted from the alkaline solution by amylic alcohol, it is customary, for the removal of the impurities, to first agitate the acid solution with amylic alcohol. If, however, for the purpose of further treatment, the acid solution is rendered alkaline, forms of impurity are again produced which pass into the amylic alcohol. If the liquid be again acidulated and the operation repeated, the danger is incurred of losing much of the sought-for poison.

After a series of experiments for obtaining the alkaloid in a pure state, with the use of various ethereal and other liquids, the author has come to the conclusion that a mixture of 10 parts of ether and 1 part of alcohol is well adapted to the purpose.

For such cases, therefore, in which the separation of small amounts of morphine is required, the following method is proposed: The finely divided portions of the cadaver are repeatedly extracted with acidulated water (urine and other liquids being first concentrated by evaporation), the combined liquids filtered, evaporated to nearly a syrupy consistence on a water-bath, extracted with from four to five times its volume of 95-per-cent alcohol, again filtered, the filtrate freed from alcohol by distillation, the residue in the flask or retort again filtered and then shaken with amylic alcohol as long as coloring matters continue to be abstracted.

Thereupon the acid solution is heated to from 50° to 60° C., an equal volume of amylic alcohol added and agitated, the liquid then made alkaline with ammonia water and again agitated for some time. After the separation and removal of the amylic alcohol from the aqueous liquid, the operation is repeated by agitation with a fresh portion of amylic alcohol. The amylic alcohol liquids are then distilled or allowed to volatilize on a water-bath, the residue evaporated to dryness and, by the aid of a gentle heat, repeatedly extracted with slightly acidulated water. The acid liquids are then filtered and the filtrate carefully washed. It is advisable to again agitate the acid filtrate with amylic alcohol for the removal of the coloring matter, and then to pour upon the separated acid liquid the above-mentioned mixture of 10 parts of anhydrous ether and 1 part of 95-per-cent alcohol, make alkaline with ammonia water, and agitate. This agitation with ether-alcohol is to be repeated several times. In this way the morphine may be obtained so deprived of coloring matters that all the reactions of the alkaloid may at once be applied.

Arsenic in Wall Paper.*

BY D. H. GALLOWAY.

A LARGE number of samples of wall paper were obtained from many different sources, paper hangers, stores, imported samples, and from friends, those from the latter being papers already upon their walls or about to be put on.

I made a determination of the arsenic in one hundred samples. These samples were taken at random and included all colors, styles, figures, and prices, the latter ranging from four cents to two dollars per roll, and some that were sold by the yard at a much higher price.

When I began this work, nearly a year ago, I supposed that, after a time, I would be able to tell by appearances whether a paper contained arsenic or not. This expectation has not, however, been realized, and I am now convinced that it is impossible to say, before examination, whether a given sample contains arsenic or not.

[The author here inserts a table in which he quotes the numbers of the samples and their respective contents of arsenious acid in Mg.; 25 samples were found free from it; 20 contained traces; the remainder from 1 to 600 Mg., though only a small number contained over 12 Mg.]

Mr. T. N. Jamieson gave me several thousand samples that had been sold to pay duty at the custom house. Twelve of these, picked out at random, showed arsenic in every case, ranging, however, quite low, from 2 to 6 Mg. These samples were, presumably, of German manufacture. The uniformity of the amount of arsenic in these papers would seem to indicate that it had been used as an anti-septic in the paste with which the pigment was applied to the paper.

The two samples, 9 and 81, containing 200 Mg. each, are probably of the same lot, as the colors are identical, though the figures are quite different.

No. 100 contains an average of about 600 Mg. per square

meter, the arsenic being almost entirely in the red, a square meter of which, therefore, contains over 1 Gm. of arsenious oxide.

No. 56 looks like the same paper, although it contains only about 50 Mg.; however, it is difficult to get a fair sample of a pattern containing figures so large and varied.

There is scarcely room for difference of opinion as to the injurious effects of large amounts of arsenic in wall paper upon those who are exposed to its influence. There is little doubt that the air in the rooms papered with arsenical wall paper becomes contaminated with arseniuretted hydrogen, particularly in damp weather. This gas is extremely poisonous, and, though in very small quantities, sometimes gives rise to most alarming symptoms.

Even if this decomposition did not take place, the air of the room must be filled with arsenic dust, particularly after sweeping and dusting, and thus cause more or less irritation of the eyes, nose, mouth, and throat, similar to the symptoms of catarrh or a cold. Some of it is swallowed with the saliva, giving rise to intestinal and constitutional disturbances of a more or less serious character, as indigestion, nausea, diarrhoea, general debility, nervous prostration, etc.

Numbers of cases of fatal poisoning, in this manner, are on record, as well as many others in which the cause was discovered in time, and on the removal of which the patients recovered. The extreme difficulty of tracing to their proper source symptoms of this character must be plain to every one. How frequently we hear the diagnosis "general debility," "nervous prostration," "indigestion," etc., the symptoms resisting all treatment until, perhaps, "rest and a change of air" are prescribed, when recovery follows, the symptoms returning, however, when the patient resumes his former work and surroundings. That many of these cases are due to arsenic in the wall paper there is abundant proof; that there are thousands suffering from this cause, of which they and their physicians are totally ignorant, is a conclusion well warranted by the evidence.

Prof. Edward S. Wood gives (Report Mass. Board of Health, 1883) a list of forty-two cases of arsenical poisoning, most of which were due to wall paper. Prof. Wood mentions a great many other articles in which arsenic has been found; among them are the following: Dress goods, muslins, linen, artificial flowers, curtains, lambrequins, gloves, calico, cloth, boot-linings, paper collars, linen collars (one collar contained 10.4 grs. of As_2O_3), hat linings, colored stockings, linings in baby carriages, bed hangings, colored wax candles, confectionery, etc., etc.

The presence of arsenic is so widespread that perhaps it would be impossible to exclude it entirely from such articles, but the deliberate use of it as a coloring for such purposes should not be tolerated. An attempt was made in Massachusetts a few years ago to secure the enactment of laws on the subject, placing the limit of arsenic in wall paper at 7 Mg. to each square meter; but the wall paper manufacturers were too influential with the legislators, and the bill failed to become a law.

There is no excuse for the presence of such quantities of arsenic in wall paper, as all the colors produced by it can be made by other means, and, in view of the helplessness of the average individual in the presence of such an insidious poison, its use as a pigment in all cases should be prohibited by stringent laws.

CHICAGO COLLEGE OF PHARMACY.

India Rubber.

PROBABLY no article of merchandise has been studied so well with a view to adulteration as rubber. We have met with many samples of rubber goods wherein the added matter averaged half the total weight, but in a recent trial it has been proved that 55 per cent of foreign materials is not an uncommon thing to find in even what are considered good samples of commercial rubber. The rubber in question contained 45.27 of pure rubber, and 54.73 [51.68 ?] of mineral matter in the 100 parts, the mineral ingredients being made up as follows:

Whiting.....	20.75 parts.
Steatite.....	9.08 "
Barytes.....	6.70 "
Litharge.....	7.50 "
Sulphur.....	5.40 "
Lamp Black.....	2.30 "

The vulcanization of this mixture with rubber was effected by heating for ninety minutes at 287° F., or equivalent to 40 pounds steam pressure.

Of course, we do not wish to infer that the mixing of the foregoing ingredients with rubber must necessarily be looked upon as a sophistication. There are many purposes to which pure rubber could not be applied; but seeing that the usual trade mixtures enable it to be put to such diverse uses, consumers should be able to specify the exact kind they require. It is an acknowledged fact that the use of rubber has, to a large extent, been given up in chemical works, on account of the uncertainty of its longevity, and this notice has been prompted by the sight of a rubber cord that has preserved its original character very well after being in use twenty-five years; but it only contains 12 per cent of mineral matter.—*Chemical Trade Journal*.

* Paper read at the meeting of the Amer. Pharm. Assoc. at San Francisco.

MANUFACTURE OF PEEL ESSENCES.

ITALY has always been the home of the orange and those of its congeners from which we derive the essences, such as lemon, bergamot, and cedron, which are of so great importance in the perfumery and beverage industries. It might have been expected that the Paris Exhibition would have contained a more representative as well as a greater number of exhibits in this class than it does. But although we were somewhat disappointed on this score, we were at least pleased to note one or two exhibits of a very superior character in the Italian Court, and we were fortunate in meeting an attendant at one of them who displayed a remarkable amount of enthusiasm regarding his native industry, and was commendably liberal in meeting our request for some information regarding his methods of working. This gentleman was Mr. C. Rizzuto, of Reggio-de-Calabre, an Italian town of 37,000 inhabitants, situated opposite Messina. Mr. Rizzuto is senior partner in the firm of C. Rizzuto et Fils, whose manufactures, in conjunction with those of Françoia Genoeese Labocetta, a relation, are exhibited by Pierro Merlino et Fils Cadet, of 67 Rue d'Hauteville, Paris, in the Italian Court of the Exhibition.

Mr. Rizzuto is a typical specimen of the robust Italian, grizzled by the hardships of the Garibaldian campaigns and the wars under Victor Emmanuel which gave Italy her freedom. A tough old soldier he is, bearing still the scars of wounds received when serving his country. But it is of his manufactures rather than his personality that we have to report. He tells us that the finest products are made by the old-fashioned sponge method. This method is very simple, and is used for the production of the finest essences. There are, we may state, nine different varieties or odors, lemon and bergamot being the chief. The trade names under which these and their varieties go are:



FIG. 1.

"Bergamote," "Bergamote dorée (mûre)," "Bergamote extrait à la main," "Citron (limone)," "Citron vert (cru)," "Portugal," "Portugal muscade," "Bigarade," "Mandarine," "Limette," "Cédrin" (cedrino)," and "Cédrat (cedrone)." By "à la main" is meant the sponge process, which consists simply of taking the whole fruit, dividing it into four parts, and pressing the external part of the peel against a sponge, which sucks up the essence as it is ejected from the oil sacs. Although this is a very primitive process, the essences that are obtained by it are far and away the best, but the loss of essence is so great and the process so tedious that it is only applicable for those products which fetch a good price. Still, Mr. Rizzuto told us, several famous perfumers will only use lemon, bergamot, etc., prepared in this way; and King Humbert, who has a liking for a single drop of "Cedrino" in his coffee, gets the à la main essence, costing 110 francs per kilo. in first hands. This flavor is also much used for ices.

For ordinary commercial purposes, the essences are pressed out of the peel by means of a machine, which we illustrate, and which, we believe, has not previously been shown, although four years ago we announced the fact that it had come into use in Italy. This machine is entirely constructed of wood, saving the handle which turns the wheel. Contact with metal seriously affects the quality of the essence. The machine stands about four feet in height, and its structure is simple and clearly shown in the engraving. The whole fruits are placed under the central circular portion, where the lower and upper surfaces are corrugated so as to press the peel unequally in order to break the oil sacs. One of the corrugated por-

tions is shown at the bottom right-hand side of the engraving (Fig. 2). The expressed essence is collected in a vessel below, and after settling for some time it is filtered through felt bags, as shown in Fig. 2. Essences prepared by this method are what are known in commerce as the finest, those being made by the sponge process being scarcely regarded as "commercial," their high price necessarily confining their use to those who specially order them. But it is, of course, possible to have different qualities of the machine-made essences, as quality greatly depends upon the condition of the fruit. There is still some doubt existing regarding the characters which true essence of bergamot ought to present. Some say it should be brownish yellow, pale yellow (as lemon is), or green. It is the last color that druggists are most familiar with, and, addressing Mr. Rizzuto on this point, we asked him what he thought about it. His reply was given in Calabrian French, and its expressiveness is lost in putting it down in cool English, but it had in it a wholesome repug-



FIG. 2.

nance towards much of the green essence which is in the market. Bergamot fruit, he told us, ripens in January, and at that stage the essence which it yields is golden in color and of very fine bouquet, but much weaker, or, as Mr. Rizzuto put it, not so strong in odor as the essence made from the green fruit in November. That essence is, of course, green, as it is pressed from the fruit and retains the color after filtration. At this point we inspected specimens of both kinds, amongst them essences made in the 1884 and 1885 seasons, which are still fresh, odorous, and perfectly free from terebinthinate taint. Mr. Rizzuto explained that the keeping properties are entirely due to the fruit being carefully selected and equally carefully expressed. "What becomes of the spoilt fruit?" was the question which naturally followed this explanation. "It is used for making the ordinary green essence. It is done in this way." And here Mr. Rizzuto submitted a photograph of the apparatus. This apparatus consists of three parts: (1) a boiler, (2) a still, and (3) a condenser. The bergamot peel is placed in the still, which is provided with a false bottom. The boiler is for the production of steam, which is passed into the still, from the bottom of which it rises, carrying with it the essential oil, and this is duly condensed and separated from the aqueous portion. The essence so obtained is of inferior odor and is water-white. Before it can possibly be placed on the market as green bergamot, it must be skillfully "doctored," to bring up both the color and the odor. Copper is the colorant. It is remarkable how easily the peel essences take up copper. Lemon becomes quite green in a day if a few chips of bright copper are immersed in it, and all the others take up the metal equally readily. Body is given to the distilled essences by adding artificial perfumes, such as the paraffin ethers, to them; and it is at this stage that sophistication sometimes takes place.

It may be useful to state here what Mr. Rizzuto considers to be the common adulterants of bergamot. First, there is the adulteration of the true expressed essence with the distilled oil. It is practically impossible to detect this admixture, as the distilled oil only reveals itself in the course of time through its terebinthinate odor. The second class of adulterants comprises rectified petroleum, turpentine, and olive oil, which are easily detected by shaking one volume of the essence with four volumes of alcohol (alcohol 6, water 1), and after an hour the adulterant, if any is present, sinks to the bottom. This method is not applicable, however, to lemon and the other essences, the purity of which may be judged roughly by mixing a few drops with a morsel of sugar, and judging the odor and taste in comparison with a standard sample. One of the most lamentable features of this industry is that adulteration is not only openly practised, but is considered to be indispensable. At first sight the reason for this does not seem to be clear; but when we keep in mind the very large number of people engaged in it, and the consequent competition, it is not so surprising. The truth is, indeed, that manufacturers have to "meet" the market. Mr. Rizzuto was careful to explain to us that his connection with the distilled oils goes only so far as their sale in the state that they are produced by distillation. Yet the demand for "fabricated" essences he believes to be enormous. This is directly traceable to consumers, especially aerated-water makers who sell lemonade at 10d. or 1s. per dozen. Cheap essence of lemon appears to be necessary for that; yet it would be better to pay 10s. or 12s. per pound for a pure lemon than 4s. or 5s. for an article heavily loaded with turpentine or petroleum. A little of the pure essence gives a good flavor, whereas

more of a sophisticated essence destroys the lemon and imparts a foreign flavor. And what is true of beverages ought to be doubly so, if that were possible, in regard to perfumes; for after all the nose is the best analyst, the most delicate sense which we have, and anything indefinite or foreign in the components of a perfume is apt to throw the whole compound out of gear, and to destroy what might otherwise be a delicious and refreshing odor.—*Chem. and Drugg.*, Aug. 24th.

Pancreatin.*

BY E. G. EBERHARDT, OF INDIANAPOLIS.

Our knowledge of pancreatin is very fragmentary, more so than in the case of pepsin, because of its greater complexity. Our methods of testing it are very crude and unsatisfactory. Let us first glance at the composition and functions of the pancreatic juice.

Origin and Composition.—A clear, viscid, strongly alkaline liquid secreted within the pancreas by cells resembling those of the salivary glands. It contains upward of 90 per cent of water and various albuminoids; among these the ferments trypsin, amylpsin, and steapsin, which are coagulated by heat and destroyed by pepsin in acid solution. Trypsin does not exist in the pancreas itself, but a zymogen that is its antecedent.

Functions.—It is the office of the pancreatic juice to finish the work left uncompleted by the saliva and gastric juice, namely, to digest fats and the remainders of starch and albuminous matter. We therefore find in it trypsin, a peptonizing ferment, amylpsin, a starch-converting ferment, and steapsin, an "emulsifying" ferment. These act only in alkaline solution, and the food pulp on entering the duodenum is rendered alkaline by the joint action of the bile and pancreatic secretion. The former undoubtedly plays also an important part in the digestion of fats. Steapsin has been differently stated to emulsify, saponify, and decompose fats. It is but rational to assume that fats must be in a soluble form before they can be assimilated. Solutions of pancreatin become more pronouncedly alkaline as they grow old. A mixture of pancreatin with a little sodium bicarb., moistened and kept warm, soon evolves carbon dioxide and volatile alkali. Is it not possible, then, that this "emulsifying" ferment is, after all, an alkali-forming ferment, producing, in conjunction with the bile, alkali wherewith to saponify and render soluble fats?

To properly value a pancreatin, then, requires a series of tests. Its proteolytic activity is determined by allowing it to act upon milk until nitric acid no longer produces a precipitate. The National Formulary requires 5 grains to peptonize 1 pint of milk in thirty minutes. Milk thus peptonized assumes a yellowish color, becomes more limpid and develops a bitter taste. All of this I have observed, but have never, even with the best sample under observation, been able to reach a point where the milk no longer precipitates with nitric acid. The end of the reaction seems to be reached when diluted nitric acid produces only a finely granular precipitate that does not separate as a curd.

The starch test is made by allowing it to act upon starch paste. The liquefaction is apparent to the eye, and the result can be checked by the reducing effect of the product upon alkaline copper solution. Iodine has been recommended as an indicator, but is not reliable, as it seems in some manner to be used up itself. If added to pancreatinized starch paste in sufficient quantity, a blue color is produced that fades more or less rapidly, reappears on continued addition of iodine solution, fades again, and so on until a point is reached where the color seems to be permanent. The emulsifying test, made by agitating together definite volumes of pancreatic solution and some fixed oil, I consider utterly worthless, as it is made under conditions differing so radically from those existing in the body. I have not been able in this way to produce a permanent emulsion.

Of many samples tested, the majority were found wanting; and of five samples of which I have a record, one only was in a measure satisfactory, the others being deficient in one, two, or all directions. This may be partly because of the differing solubilities of the pancreatic enzymes, the alcoholic strength of the precipitating liquor thus determining the preponderance of one or the other of the ferments. Pancreatin also differs with the source, herbivorous animals yielding a product rich in amylpsin, carnivora one rich in trypsin, and omnivora would occupy an intermediate position. For this reason, pancreatin of the hog is preferred.

In connection with this subject is

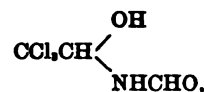
Query No. 16.—Liquid pancreatin, N. F., develops a putrid odor on standing a few weeks; what is the cause, and how can it be obviated?

The odor resembles somewhat that of lye, and has just a tinge of putridity. The preparation has then a strongly alkaline reaction, effervesces copiously with acids, and evolves volatile alkali on heating. This is the result of the pancreatic decomposition of the albuminous and mucous matter present in commercial pancreatin. The difficulty can, of course, be obviated by leaving out the bicarbonate of sodium and rendering the preparation slightly acid. On

standing, this preparation, even if rendered subsequently alkaline, loses much of its efficiency. The only recourse is the addition of a corrective, some of the aromatics or essential oils. Even this, while correcting the odor, does not overcome the nauseous taste. It is preferable to preserve the pancreatin in the state of powder, as it thus remains more active, and this change occurs, if at all, only to a limited extent.

Chloralamide.

THE last addition to the list of medicinal hypnotics is chloralamide—a combination of chloral and formamide. This substance is described by Dr. Rabow in the *Centralblatt für Nervenheilkunde*, August 1st, 1889, as possessing the formula of



and occurs in colorless, odorless crystals, which have a faintly bitter taste, and which melt at 115° C. It is soluble in ten parts of cold water and one part of absolute alcohol. It is more readily soluble in warm water, yet the temperature must not be raised above 140 F., since at this point separation of the two components readily occurs. Weak acids or nitrate of silver have no effect upon this solution; while, on the other hand, it is decomposed by caustic alkalies and alkaline carbonates.

The name chloralamide is by no means a satisfactory one, since the substance is a chemical compound of chloral and formamide, and should, therefore, be described as a chloral formamide or as formide of chloral.

Professor Rabow states that numerous experiments on animals and men proved that this remedy, in doses of from 15 to 60 grains, is capable of producing sleep, and although sleep does not follow its administration as soon as after the use of chloral hydrate, it yet appears much earlier than after the use of sulphonal.

The writer claims that he never observed any unfavorable influence of this substance on the digestive organs, but he states that he does not feel warranted in giving any opinion as to its action on the circulation, leaving that to be determined by subsequent study. He claims, however, that the uncomfortable and prolonged after-working of sulphonal is not produced by chloralamide, while its solubility is a further recommendation of the latter.

The doses which he administered varied between 15 and 60 grains, given in the form of a powder, in capsules, or dissolved in wine or beer, recommending as the best means of administration that it be given in tea or mulled wine.

To produce satisfactory sleep chloralamide must be given in somewhat larger doses than chloral hydrate, 45 grains of the former corresponding to about 30 of the latter. In the author's experiments, sleep followed within twenty-five to thirty minutes after its administration, and lasted from six to eight hours.—*Therap. Gaz.*

In addition to statements previously made regarding this new hypnotic, the following note by R. Caswell Harrison in the *Pharm. Journ.* (Sept. 7th) will be of interest.

The solubility is stated to be 1 in 9 of water. I have failed to dissolve 20 grains in 240 fluid grains of water, the actual solubility being about 1 in 14.

On heating in a dry test tube it melts and gives a strong smell of chloral, which condenses on the sides of the tube; and on further heating, chars, and gives a peculiar smell recalling hydrocyanic acid and onions. Heated with solution of potash, it gives off a smell of chloroform and ammonia. H_2SO_4 , HNO_3 , HCl , and FeCl_3 respectively have no apparent action in the cold.

On adding a few grains to a mixture of 3 ss. of strong sulphuric acid and 4 drops of 90-per-cent carbolic acid, and warming, the mixture boils almost immediately, and quickly changes to a bright red color, with a strong chloral odor. This test will distinguish it from most of the new synthetical products, if applied as above, the reactions being shown by the following table:

ANTIPYRIN.	ANTIPYRIN.	CHLORALAMIDE.	PANCREATIN.	SULPHONAL.
No effect.	No effect.	Bright red color, with chloral odor.	Dark purplish brown, with strong acetous odor.	Bright emerald green, immediately changing to dark, dirty green with strong sulphurous odor.

Chloralamide does not reduce Fehling's solution or decolorize Pavy's.

Florentine Orris (*Iris florentina*) is said to have been discovered in considerable quantity growing in South Carolina.

* Paper read at the annual meeting of the Indiana Pharm. Assoc.

(ORIGINAL TRANSLATION.)

Estimation of Morphine in Opium.*

BY F. A. FLUECKIGER.

A QUANTITY of 3.483 Gm. of opium (marked "B"), dried (before being weighed) at 100° C., was mixed with 9 Gm. of recently ignited powdered pumice, the mixture inclosed in a paper bag, transferred to an apparatus for continuous extraction (of the form recommended by Prof. Flueckiger), and exhausted with officinal chloroform. Upon evaporation of the latter, there remained, after drying at 100° C., 18.9 per cent of a smeary, dark-brown residue, in which colorless radiated crystal groups could be recognized.

Eight Gm. of the same powdered opium were pressed with some force into a flat-folded filter of 10 Cm. diameter, placed into a funnel, and 30 C.c. of chloroform gradually poured upon it, the funnel being covered in the intervals. It was found that the escape of the chloroform from the stem of the funnel could be but slightly hastened by tapping the latter. Upon evaporation of the chloroform, the residue amounted to only 6.6 per cent of the powdered opium. When the experiment was modified so that the powdered opium was packed in the filter with less force, the residue left upon evaporating the chloroform rose to 10.15, 10.27, 11.0, 11.5, and once even to 14.2 per cent.

Another sample of powdered opium, of equal fineness, which may be designated as "G," yielded, by simple washing upon a filter, 18.8 per cent of residue after evaporation of the chloroform. It is evident that the amount of this residue will be very unequal from different kinds of opium.

Even when using the excellent filters of Schleicher & Schuell, the washing of opium with chloroform may consume easily from one to two hours. This amount of time is, however, scarcely objectionable, since it enables the removal of 10 to 18 per cent of noxious ingredients. It is preferable to use folded filters, not because the chloroform passes through them more readily than through a flat-folded filter, but because the opium may more easily be detached from the former, particularly if it is opened out at the right time, while the powder is still somewhat moist. Of course, the powdered opium may also be agitated with the chloroform in a flask, and the mixture then transferred to a filter. The same flask may be used again to receive the opium after the chloroform adherent to it has been dissipated.

A much more efficient method of purifying opium, however, consists in this, that the powdered opium is packed in a folded filter by tapping, and then moistened with a mixture of 10 C.c. of ether and 10 C.c. of chloroform. Next, 10 more C.c. of chloroform are poured on, and may be followed with advantage by 10 or 20 C.c. more. On using 10 C.c. of ether and 20 C.c. of chloroform upon the opium marked "B," 11.6 per cent of chloroformic residue were obtained, that is, nearly as much as when chloroform alone was used. Hence it is always advisable to replace a portion of the chloroform by ether.

Opium purified in this manner looks very much better than the original powder, and, after being dried, is very easily penetrated by water.

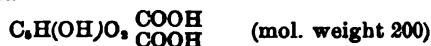
When assaying *extract of opium*, the treatment with chloroform is of no advantage.

If the residue which is obtained by means of chloroform and ether, or by chloroform alone, be warmed with water and the liquid filtered, the filtrate will be yellowish and slightly reddened blue litmus paper. Neither iodic acid nor ferricyanide of potassium with ferric chloride reveals any traces of morphine in it. Ammonia, however, causes a copious precipitate of narcotine. Iodine water, iodine with iodide of potassium, tannic acid and iodohydrargrate of potassium show the presence of a considerable quantity of alkaloid, which turns out to be narcotine, as it is precipitated by acetate of sodium. (This reaction was discovered by Plugge; see *Arch. d. Pharm.*, 1887, 344.) The aqueous liquid also contains meconic acid.

The above mentioned smeary (chloroformic) residue, which consists mostly of caoutchouc and wax (see Flueckiger, "Pharmakognosie," 1883, 167), can only with difficulty be exhausted by water. After this has been accomplished as far as possible, acetic acid will still extract some narcotine from it, but no meconic acid. Sometimes, but not always, it is also found that the extract obtained by acetic acid liberates a doubtful trace of iodine from iodic acid. It may therefore be conceded that traces of morphine may be extracted from opium by chloroform, though the quantity is exceedingly minute. In other words, though morphine and its salts are regarded as insoluble in chloroform or ether, this insolubility must not be taken as absolute.

Since the aqueous extracts of opium redden blue litmus paper, the question arises: What causes the acid reaction? Besides meconic acid, scarcely anything but sulphuric acid can be thought of here; but the latter is not present in the free state, since the extract, though reddening litmus, does not affect tropæoline. Even free meconic acid

has not been encountered, at least in one experiment (Flueckiger in *Arch. d. Pharm.*, 1885, 259). Regarding the latter, however, more experiments and on a more extended scale are necessary. The acid reaction of the extract is therefore probably due only to salts of narcotine, because the latter is incapable of neutralizing acids, while sulphate of morphine (for instance) on the other hand is indifferent to litmus. Hence we may assume that there are present meconate and sulphate of narcotine, and perhaps also acid meconate of morphine, and the question now arises how solvents behave towards these salts, which are but little known, though Dott has paid some attention to the two former. If we assume meconic acid to have the formula



two meconates will have to be taken into consideration in each case. Dott (*Pharm. Journ.*, 1884, 581) has only analyzed the sulphate of narcotine ($\text{C}_{22}\text{H}_{22}\text{NO}_7$), $\text{H}_2\text{SO}_4 \cdot 4\text{H}_2\text{O}$, and did not succeed in overcoming the difficulties connected with the preparation of the meconates. An exact investigation of these salts, though desirable, not being rendered necessary for present purposes, I contented myself with merely preparing the salts. On adding to 1 mol. of narcotine a suitable quantity of water and 1 mol. of meconic acid, or using 2 mol. of the former and 1 mol. of the acid, a syrup is obtained which sinks to the bottom in the water. On shaking the aqueous solution with chloroform and evaporating the latter, a residue is left behind which crystallizes after some time, and in which meconic acid and narcotine can be detected. Since the residue is soluble in chloroform (in fact, had been obtained by means of this solvent), it can be nothing but *meconate*, because *free meconic acid* is *insoluble* in chloroform. An analysis of the narcotine meconates could not be undertaken, as they turned out to be mixtures. Whether they still contained free narcotine or not is of no importance here. The only object was to prove that not only narcotine but also its meconates are abundantly dissolved by chloroform; the same is true for the syrup above mentioned. At all events, on evaporating 1 mol. of meconic acid with water, and 1 or 2 mol. of narcotine, a mass is obtained which is easily soluble in chloroform.

The same is the case with the sulphates of narcotine. These are always slowly soluble in water, remarkably freely in chloroform, less so in alcohol, and still less in ether. An absolutely pure sulphate could not be obtained; the results of the analyses agreed neither with an acid nor a neutral salt. It was sufficient to show that they are most easily dissolved by chloroform. If sulphate of narcotine is present in opium, it is probable that it is the salt containing 2 mol. of the base. Hence I prepared the sulphate by bringing together, under most gentle heat, dilute sulphuric acid with a large excess of narcotine, separating the salt which crystallized on cooling in small needles, drying, and washing with ether. Of course, litmus is strongly reddened by this "neutral" sulphate; but even if some more sulphuric acid is carefully dropped upon it, it has no effect upon tropæoline.

From the aqueous solution of this sulphate, the base is withdrawn by chloroform.

If 1 or 2 mol. of morphine and 1 mol. of meconic acid are brought together with water, crystalline groups are soon noticed. The needles obtained from equal molecules strongly redden litmus paper, but the meconate containing 2 mol. of morphine is neutral. The neutral salt is so little soluble in chloroform that at 20° C., 2553 parts of the latter are required to dissolve 1 part of the salt. Still more chloroform is required to dissolve the acid meconate of morphine. The meconates of morphine are, therefore, practically insoluble in chloroform.

Acid sulphate of morphine cannot be prepared. I have also found that the neutral sulphate, which is entirely insoluble in chloroform, is not rendered soluble therein by the addition of sulphuric acid.

It is seen from these facts that the meconates and sulphates, which alone need be considered here, behave very differently. Those of morphine are insoluble, and those of narcotine very soluble in chloroform. It is therefore plain that the extraction of the latter from opium, by means of chloroform, must be advantageous. Formerly, I proposed ether for this purpose (*Arch. d. Pharm.*, 1885, 298, 475). But this is not as good a solvent as chloroform for the narcotine salts. Moreover, free narcotine requires more than 100 parts of ether, but only 2 parts of chloroform for solution.

All indications render it highly probable that morphine is contained in opium as *neutral sulphate* (*Arch. d. Pharm.*, 1885, 265); narcotine chiefly in a free state, to a less extent as meconate. The latter is probably one of the causes of the acid reaction of extracts of opium, but not the only one. Possibly there is also an acid meconate of morphine.

If opium is completely extracted with chloroform, so as to remove the meconate of narcotine, and if the opium is then extracted with water, the resulting filtrate, containing most of the meconic acid, reddens litmus quite strongly. Addition of ferric chloride produces a very dark red color. Hence a part of the meconic acid must have existed either in a free state or combined with morphine

* From the original published in *Archiv d. Pharmacie*, 1889, 721-732.

or with calcium or magnesium. This point requires further investigation.

However this may be, it appears not only justifiable but necessary to purify opium, previous to an assay for morphine, by means of chloroform, which may be done without technical difficulties, if the task is properly performed as directed above.

Some might, perhaps, demand that a process of determining morphine in opium should yield as exact results as that for determining barium as sulphate. An analysis of opium in this sense I regard as an impossibility. According to other views, the final object, particularly for a pharmacopœia, can only be to discover a method which, in as simple and cleanly a manner as possible, yields such a percentage of morphine as undoubtedly and actually corresponds at least to the result of the analysis. When we hear practitioners of medicine declare that they do not care whether opium contains 2 per cent more or less than the average quantity of morphine, then the pharmacopœias need not care either whether the opium, tested by the official process, in reality contains $\frac{1}{4}$ per cent more of morphine or not.

Very much has been written regarding such a process of assay. I believe to have conclusively shown that water is the only proper menstruum for extracting opium, and I now attach the further direction that the opium should first be treated with chloroform (and ether). When the powder has afterwards been freed from the remainder of the solvents, it is shaken with ten times its weight of water and set aside for two hours. As the opium, after purification with chloroform, is most easily penetrated by water, a maceration of one hour would also be sufficient, particularly if the flask is repeatedly agitated. If accurate results are desired, it is necessary to ascertain how much soluble matter the opium under examination yields to ten times its weight of water. For instance, the first-mentioned opium, "B," which after being powdered had been kept in a stoppered bottle, yielded to water (between 15° and 20° C.), upon complete extraction, 57.6 per cent of soluble matter. Hence it may be assumed that the residue from opium obtained by exhaustion with water, and dried at 100° C., amounts on an average to 40 to 43 per cent. The same opium, "B," dried first on a water-bath and afterwards over sulphuric acid, lost only 1.96 per cent of moisture. After opium has once been dried to this degree, or entirely dried, it is but little prone to attract moisture again, although it will cake: 2.8685 Gm. of opium "B," which were exposed during July in a cool room in an open capsule, during 14 days, weighed at different times 2.8680, 2.8270, 2.850, 2.8680 Gm. Nevertheless, it is always advisable to dry any sample of opium to be assayed on a water-bath, even though only for a short time, since the presence of moisture renders it less accessible to chloroform.

After the aqueous extraction of the opium has been accomplished, there appears to remain no other way than to use a definite portion of it—for instance, that corresponding to half the added water—for the analysis. Opium "B," had yielded to water 57.6 per cent of soluble matters. If 8 Gm. of this are taken for the determination of morphine with 80 Gm. of water, then 4.6 Gm. of the opium have gone into solution. Hence, in order to represent 4 Gm. of the opium, 42.3 Gm. of the liquid have to be obtained by filtration. The German Pharmacopœia directs in place of this quantity 42.5 Gm.

From the aqueous solution, which has a less dark color if the opium had previously been extracted with chloroform, the morphine may be precipitated by ammonia, but the precipitate is accompanied by brown flakes which I designated once (*Arch. d. Pharm.*, 1885, 220) as a "puzzling precipitate." It is most certainly not narcotine; if the liquid extract of opium, whether purified from narcotine by chloroform or not, is treated with a little ammonia and the resulting precipitate immediately filtered off and dried, a smeary mass is obtained which is insoluble in chloroform, and therefore cannot be narcotine. Dieterich labors under a misapprehension when he assumes (in *Helfenberger Annalen*, 1886, 44) that my "puzzling" precipitate was simply narcotine and even crystalline. The precipitate in question is amorphous, and even to-day I am compelled to regard it as a puzzle. Now Prollius already found (*Arch. d. Pharm.*, 1885, 269) that alcohol can prevent this contamination of morphine separated by ammonia. But here comes another difficulty. If only ammonia is added (with or without ether), which has no influence upon the precipitate in question, a very impure morphine is obtained, which would eventually have to be purified by recrystallization. But this is inadmissible, since the recrystallization of small quantities necessarily entails loss. It is better to prevent, in the beginning, the formation of the precipitate by the addition of alcohol; but then some of the morphine is retained in solution by the alcohol, and escapes being weighed. The quantity of morphine thus lost to the assay depends mainly upon the amount of alcohol added. The less the latter is, the smaller will be the loss; the more alcohol is used, the purer and handsomer will be the separated morphine. Operating upon 8 Gm. of opium, and taking 42.5 Gm. of filtrate, the smallest quantity of alcohol, to be serviceable, is 7.5 C.c. (spec. gr. 0.830). If to this is added 1 C.c. of water of ammonia (sp. gr. 0.960), and the whole thoroughly shaken, the morphine will crystallize out, more hand-

somely still if 15 C.c. of ether are added. In this case, the separation of the alkaloid takes place in the zone dividing the two layers of liquid, and when the crystals grow larger they sink to the bottom.

Besides, the function of the ether is to take up the narcotine. According to what has been said above regarding the efficiency of chloroform, the opium cannot any longer contain much narcotine. Nevertheless, it must be observed that the purification of opium by means of chloroform (with or without ether) is an operation which, naturally, cannot always be equally successful. By using the best filtering paper, and promoting the dropping-off of the chloroform by assiduous tapping, nearly the whole of the narcotine and its meconate is extracted. Should this not be the case, however, the addition of 15 C.c. of ether to the final mixture always removes the rest.

Dieterich has furnished (*Helfenberger Annalen*, 1886, 39) convincing proofs that agitation greatly accelerates the separation of morphine. To prescribe a certain measure or amount of shaking, in a pharmacopœia for instance, is impossible. Experiments have, therefore, been made to ascertain whether it can be avoided altogether. If 42.5 Gm. of the liquid extract, mixed with 7.5 C.c. of alcohol, 15 C.c. of ether, and 1 C.c. of ammonia, are briskly shaken, the morphine begins to separate soon; but if the mixture is allowed to stand quietly, the separation is scarcely completed after one day. This is, therefore, another difficulty which cannot be removed by any device, but can only be evaded to a certain degree. If the mixture is kept during six hours in a stoppered flask, and is repeatedly shaken, the morphine will almost entirely separate. The more frequently the mixture is shaken the more complete will be the separation; the less it is shaken the handsomer and purer will be the morphine. Hence there is only an intermediate way which cannot be prescribed with perfect accuracy. Who can describe or prescribe the frequency or intensity of the shakes given to such a mixture (without using a shaking machine)?

It must be conceded that morphine, contained in a liquid in which are present sulphate and meconate of ammonium, may ultimately displace the ammonia and again pass into solution (*Schmitt in Arch. d. Pharm.*, vol. 223, 293). Yet this takes place rapidly only with heat.

It is further known that, after the separation of morphine, meconate and sulphate of calcium likewise begin to deposit (*Arch. d. Pharm.*, vol. 223, 268). But this takes place very slowly, and the very fine calcium salts form a dense magma adhering rather firmly to the bottom. It is not difficult to determine the time when the morphine may be collected without the calcium salts. If it is, however, desired to keep the latter out altogether, 0.2 Gm. of oxalate of ammonium may be dissolved in the 80 Gm. of water used for extracting the opium. The acid reaction of the liquid extract is not strong enough to prevent the formation of calcium oxalate. The latter gradually separates and remains afterwards on the filter.

Unfortunately, it is impossible to determine the exact time when the separation of the morphine is completed. Hence it will be necessary to form some agreement regarding the time when the morphine is to be transferred to the filter. It is contained in a mother-liquid still containing most of the meconic together with sulphuric acid, now probably combined, mainly with ammonia. Moreover, the liquid contains coloring matters which are so far unknown to us. If the mother-liquid is evaporated on the water-bath, it loses ammonia, or at least assumes an acid reaction, and upon addition of ammonia yields a very copious precipitate (the "puzzling" precipitate above mentioned) which is soluble in alcohol.

The morphine is therefore accompanied by impurities the removal of which has been so far attempted by the use of very dilute alcohol and by ether. If the opium is previously purified by chloroform, it does not seem to me necessary to purify the morphine after it has been collected on the filter. I believe it is sufficient to transfer the alkaloid yet contained in the flask, upon the filter, with the aid of a little water, then to dry the flask and to weigh it so as to determine the weight of morphine still adhering to its interior. It has been proposed to wash the morphine with water which had previously been saturated with this alkaloid. No objection can be made against this refinement; it certainly does not entail much expense, since 1 part of morphine requires nearly 5,000 parts of water for solution.

The principal quantity of the morphine is best collected in a double-folded filter, since the mother-liquid is easily and completely drawn into the substance of the paper. After proper drying, the morphine may readily be detached from the filter and transferred to the flask, in which the whole of the morphine is finally dried together. It certainly is less accurate to weigh the morphine upon the filter, no matter in what manner this may be done.

Several writers have shown the error of the statement formerly made that morphine dried at 100° C. still retained water of crystallization. At this temperature it is finally rendered anhydrous.

To separate, in one operation, the whole amount of the morphine present in an opium in a perfectly pure state is a problem that cannot be accomplished in any manner. Yet it is important to assure one's self that it is sufficiently pure, for instance, free from narcotine. For this pur-

pose, I have proposed lime-water (*Arch. d. Pharm.*, vol. 223, 264). I find now that 70 parts of lime-water, saturated at 15° C., are able to dissolve, though not rapidly, 1 part of morphine; narcotine is practically insoluble in lime-water. Morphine obtained from opium previously purified by chloroform yields with 100 times its weight of lime-water a clear, faintly yellowish solution which becomes darker very slowly. The tint of this solution shows that the morphine is not quite pure. The depth of the tint shows the degree of impurity present. The more alcohol is added to the liquid extract the purer is the morphine, though the amount is reduced by so much as the increased quantity of alcohol is able to dissolve. It would suggest itself to determine this quantity once for all; I must confess, however, that I prefer to do without such a coefficient of correction.

The experiences and views propounded in this paper require completion in various directions. Nevertheless, they are sufficient to base upon them a method of opium assay which may be designated as good. If it can be rendered still more perfect, so much the better. The process then is as follows:

[*Flueckiger's Improved Assay Process for Opium:*]

Introduce 8 Gm. of powdered opium (of a degree of fineness to be fixed upon later) into a folded filter of 12 Cm. diameter, tapping the filter [to make the powder settle evenly], and dry the whole at 100° C. After half an hour, pour upon the powder a mixture of 10 C.c. of ether and 10 C.c. of chloroform and tap the funnel, which should be kept covered, frequently [to cause the solution to flow down]; finally add 10 C.c. more of chloroform. Cause as much of the fluid to drop off as possible, then spread out the filter and dry it, with its contents, at a very gentle heat. Transfer the powder to a flask, shake it (whether it has caked together or not) with 80 Gm. of water repeatedly and forcibly, and filter after two hours. (There is no objection to add to the water, previously, 0.2 Gm. of ammonium oxalate, but two hours will scarcely be sufficient to precipitate all the calcium.) Transfer 42.5 Gm. of the filtrate into a flask of known weight, add 7.5 C.c. of alcohol (sp. gr. 0.830), 15 C.c. of ether, and 1 C.c. of water of ammonia (sp. gr. 0.960), and shake repeatedly and briskly. After six hours transfer the contents of the flask upon two plaided filters, folded together, and of 10 Cm. diameter, and transfer as much of the morphine as possible upon the filter, by washing, using about 10 C.c. of water. Dry the filter first at a gentle heat, lastly at 100° C., and then transfer the morphine back into the flask, which has meanwhile also been dried at 100° C. Finally determine the total weight of morphine, when it remains constant at 100° C.

On using this process upon the opium "B," I obtained 12.90-13.12-13.35 per cent of morphine, which was not pure white, but soluble in lime-water with very little tint and to a clear liquid. I must acknowledge that the same opium, when tested by the process given by Dieterich (*Helfenberger Annalen*, 1887, 78), likewise yielded 13.4 per cent of morphine, but its solution in lime-water was very dark brown. In another experiment when only 5 C.c. of alcohol were used in place of 7.5 C.c., the yield was 12.35 per cent of unclean morphine not yielding a clear solution in lime-water.

If the mixture of 42.5 Gm. of liquid extract, 7.5 C.c. of alcohol, 15 C.c. of ether, and 1 C.c. of ammonia is allowed to stand quietly for six hours, the quantity of morphine obtained is less. At one time, for instance, it was 11.71 per cent. By very active shaking, however, as much as 14 per cent could be obtained from the same opium. But in this case the morphine was not sufficiently pure. Moreover, in this experiment the remainder of the filtrate was used, from which the above 11.71 per cent had first been obtained.

When 8 Gm. of opium, after being treated with chloroform, are mixed with 80 Gm. of water, the amount of filtrate which may be collected will be about 73 Gm. If the first 42.5 Gm. of this are taken for an assay, and the morphine in the second portion of the filtrate (30.5 Gm.) is also determined, the latter will seldom be as handsome as that obtained from the first or main portion.

The foregoing statements refer mainly to small quantities of the opium "B," which happens to be in my hands at present; it is possible that some of the statements may be found not to be applicable to every other kind of opium, or when working with large quantities. For a drug of such complex composition is probably liable to much greater variations than we have any idea of. Our knowledge of opium is, upon the whole, yet altogether too fragmentary, as I have already pointed out elsewhere (*Pharmakognosie*, p. 167). The larger half of opium consists of substances which are unknown to us.

If the supposition that the morphine exists in the opium as sulphate were correct, it would suggest itself to determine the quantity of sulphuric acid. It will certainly be worth while to determine whether there is a regular ratio between the morphine and the acid.

Phenacetin Poisoning.—Dr. Hollopeter reports, in the *Medical News* of Sept. 21st, a case of poisoning resulting from taking three doses of 7½ gr. each of phenacetin during six hours.

Extracts Prepared from Liquids by Cold.

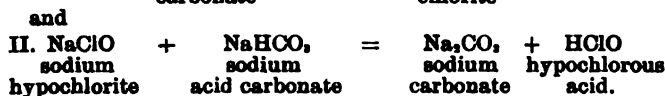
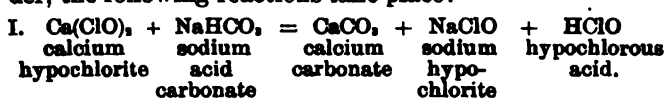
THE principle of separating liquid and solid constituents of a complex solution, by means of cold, is well known, and has been applied heretofore in many branches of technical art. (Compare, for instance, this journal, 1888, 27.) During the last year or so, however, its application has been recommended for pharmaceutical operations, for which it had not been thought of before. (In this connection, the paper by Prof. J. U. Lloyd, on p. 81 of our volume for 1888, should be consulted.) And it has even been practically carried out in the preparation of pharmaceutical extracts, as is shown by the exhibit made by Amédée Vée (of Vée et Cie., 24 Rue Vielle du Temple, Paris) at the Paris exhibition.

It is in certain respects a modification of the method proposed by Alfonso Herrera in 1878, and even earlier (1867) by M. Menier, for concentrating fruit juices. The new application of the method has been worked out by M. Vée and his son, Georges Vée, and in principle it simply is the separation of the water of the infusion or liquid extract by crystallization at a low temperature—solidification of the whole, as in Adrian's process, being prevented by constantly agitating the liquid with mechanical agitators. From the crystalline magma, the liquid extractive portion is afterwards removed by a centrifugal separator. The apparatus consists of two parts, one for producing the freezing liquid, and the other for concentrating the extracts. The former portion is made up of two parts: one part, covered with wood, is a methylchloride refrigerating apparatus, as devised by Prof. Vincent, by which a solution of calcium chloride, contained in cylinders, is cooled down to a temperature of -12° to -18° C. This cold solution is afterwards pumped into the freezing-tank, which is divided into four compartments, each one being capable of holding an "extract concentrator." The concentrators are cylindrical, made of copper, are nickel-plated inside, and are fitted with mechanical agitators. The lids are, when fixed, thoroughly secure, and do not admit the calcium chloride solution. When the contents of a concentrator have been brought to the proper degree of "concentration," the vessel is raised from the tank, thoroughly washed outside, and the contents transferred to the centrifugal machine, which, by the way, is cooled by the calcium chloride solution from the tanks, which is made to circulate around it. M. Vée states that so far as the principal pharmaceutical extracts are concerned, the frozen liquid separated from the extractive matter contains little organic deposit. Thus, in the case of an extract made from 5 kilos. of digitalis plant, the ice contained only 30 Gm. of deposit, and it is questionable if this had any therapeutic activity. The specific gravity of the melted ice varied from 1.000 to 1.004, so that it could contain little or no solid material, especially when we consider that it had been separated from liquids having an initial density of 1.011 to 1.037. This, then, is the process which M. Vée uses for making his extracts. It may be useful to give at another time a description of the centrifugal separators, which so far have had little application in pharmacy proper. It is undoubtedly owing to the fine machinery which French pharmaceutical manufacturers employ that they have attained to such excellence in the production of this class of preparations.

Turning to the exhibits, we have to note in regard to Vée et Cie.'s extracts, that they are remarkably transparent, and generally of a creditable character.—After *Chem. and Drugg.*

A Free Acid in an Alkaline Solution.

WHEN bicarbonate of sodium acts upon bleaching powder, the following reactions take place:



There is thus obtained a free mineral acid existing in a strongly alkaline solution. If the solution is heated, the hypochlorous acid decomposes, with formation of hydrochloric acid and oxygen, the former of which liberates carbonic acid gas from the sodium carbonate, so that a mixture of this gas and of oxygen is evolved. A solution of sodium hypochlorite does not give off any oxygen when boiled, unless carbonic acid gas has first been passed through it.—P. T. AUSTEN in *Am. Chem. J.* and *J. Chem. Soc.*

Gnomium.—Though the existence of this new element, reported as constantly accompanying nickel, and first discovered and separated by Krüss and Schmidt, is doubted by Fleitman and others, its true elemental character seems nevertheless to be authenticated. Samples of gnomium oxide, gnomium chloride (in aqueous solution), nickel free from gnomium, and nickel oxide free from gnomium, were exhibited several months ago at a conversazione of the Royal Academy by Dr. Hugo Mueller.

East-Indian Opium Industry.

At the request of the secretary of the Society of Chemical Industry, I have compiled, for the information of the Section, the following notes, the greater part of the material of which already exists on record, for the most part, however, in the official publications of the governments of Bengal and of India, which are not perhaps within reach of many in this country [England].

The opium poppy is a native of Asia Minor, but, having been so long and generally cultivated in Europe and parts of Asia, it is now naturalized more or less in many different countries. The precise date of its introduction into India is unknown, but it can be traced as far back as the sixteenth century, during the latter half of which the produce of the opium monopoly in the sarkars of Allahabad and in Ghazipur was 1,000 chests, according to the A'in Akhbar of Abul Fazul. It had attained considerable importance by 1786, at which time Lord Cornwallis wrote a minute respecting the best method of deriving a revenue from opium. It has now been long extensively cultivated in the Upper Gangetic plain, in Behar, Bundelkhand, and Malwa. "The area under poppy cultivation in the N. W. Provinces and Oudh is scattered over 88 of the 49 revenue districts in these provinces, and occupies more than one-quarter million acres, and necessitates the employment of no less than two and one-half million persons in the fields." For the Chinese market the opium of the Behar and Benares agencies is commercially the best, as being the most approved by the Chinese, although *officially* it is inferior to the Smyrna drug.

The cultivation of opium in India in British territory is a government monopoly, existing for the benefit of the imperial revenue. The Opium Department is for convenience administered, under the lieutenant-governor of Bengal, by the Board of Revenue of the Lower Provinces. Subordinate to the board are the two opium agents, each of whom is in charge of one of the two opium agencies. One of these is the Behar agency, with its headquarters at Patna, and situated entirely in the Lower Provinces. The other is the Benares opium agency, situated in the N. W. Provinces and Oudh, and having its headquarters at Ghazipur, on the Ganges, about 40 miles from Benares. In each agency there are under the agent two sets of officials, the district officers concerned with the production of the raw material, and the factory staff occupied in its manufacture.

The system of cultivation at present in force in British territory is briefly as follows: No poppy is allowed to be grown save with the permission of government. Government grants this permission to suitable cultivators on condition that only a certain definitely agreed-on area of land shall be sown by each with poppy, and that the entire produce shall be made over at the proper time to the agents of government in exchange for its value in cash calculated at the rate (at present) of Rs. 5 per ser of 70' consistence. (70' consistence opium is opium of which 100 Gm., when dried at 100° C., yield 70 Gm. residue. Opium of this consistence is called standard opium.) Permits or licenses to grow poppy are issued in the period from August to October, at which time the district officers meet the would-be cultivators or their agents and settle more or less directly with each the area he is to be allowed to cultivate. The experience of many seasons, as recorded in the books of his office for each locality, enables a district officer to estimate very closely the average quantity of standard opium that the particular area licensed to any cultivator is likely to produce. In this way the district officer is able to keep within the limits of the quantity his district has been called on to supply, which quantity in turn is based on the indent sent down by government to the agent, and by him apportioned among the districts under his charge. At the time of settlement, the district officer makes to the cultivator a cash advance of a certain percentage of the value of the out-turn of standard opium that the area he has undertaken to cultivate is estimated to produce. For such advances, and for similar advances towards the purchase of bullocks, the sinking of wells, etc., and aggregating over 200 lakhs of rupees (nominally two million pounds sterling) per annum, no interest is charged by government, the cultivator enjoying the use of the money free. The advances are in due course recovered in the shape mainly of produce, the balances being paid up in cash, and outstandings of any size are little known.

Having settled with the district officer, and been licensed to sow a certain area, the cultivator returns home and prepares his land, and makes other necessary arrangements, and in due course, about November, he commences to sow his seed. During the growth of the plant, the industrious cultivator takes care to attend to its proper tillage, watering it at the proper times, and keeping the ground free from weeds.

During this season the district officer with his staff goes on tour throughout the area under his charge—which may measure many hundred square miles—in order to measure the ground cultivated by each licensee, for the purpose of seeing that he has sown up to his engagements (on which his advances were calculated), and not in excess of his engagements (as this would throw out the arrangements for complying exactly with the indent sent down by gov-

ernment); to see that the cultivation is being carried on in a proper manner (the plant being watered as required, and the soil kept clear of weeds), and that no other crops are being simultaneously cultivated in the poppy field; to give, if necessary, a further cash advance on account of the value of the estimated out-turn; to see that no illicit poppy cultivation is being practised (which would lead to smuggling, and to the defrauding of the excise revenue); and to report, periodically, to the agent on the general prospects of the crop.

About the beginning of February the plants begin to flower. At this time is begun in certain districts the preparation of "leaf." "Leaf" is the technical name for the material used at the factory to form the shell of the opium cake in course of provision for the China market. About the close of the third day of the flower's expansion, the petals are in such a stage of maturity that they are ready to drop off the top of the seed-vessel at a touch; at this stage the cultivators go through the fields in the afternoon, and collect the petals and carry them home. In the evening, after she has baked her husband's bannock, the cultivator's wife takes two or three handfuls of the petals and throws them on the top of the hot griddle-iron, and as the gummy juice of the petals exudes by the heat, she presses the petals down by a damp cloth which she skilfully manipulates, until, what with the steam from the cloth and the gum in the leaves, the petals become agglutinated, and ultimately take the pancake-like form of the so-called "leaf." The leaves are carefully dried, and are in due course brought by the cultivator to the district officer, who receives them on behalf of government, and pays for them according to their quality, at from Rs. 10 to 50 per maund (of 82½ lbs.), and forwards them to the factory at the headquarters of the agency for disposal.

The annual consumption of "leaf" in the preparation of the shells of the provision opium for the China market is very large—amounting to from 16,000 to 20,000 maunds—representing the petals of over 5,000,000,000 flowers according to Scott's calculations.

In the course of from 7 to 10 days from the fall of the flower leaves, the capsules are sufficiently mature for the extraction of the drug, becoming plump and firm, and coated with a fine whitish bloom.

The incisions are now commenced, and are carried on regularly every third day, and, according to the condition of the plant and the time of the collection, the number of lancements required to extract all the juice varies from one to five or six, and perhaps seven in isolated cases. The lancing is carried on in the afternoon, and consists of three or four vertical incisions performed at one operation by three or four primitive lancets tied together with cotton thread. The juice exudes slowly, and is milky white at first, the outer part of the tear gradually changing to a pinky salmon color. Next morning the tears that have exuded are scraped off by an iron trowel-shaped scraper and put into a metal dish, from which at the cultivator's house they are transferred to unglazed earthen vessels set ailt to allow excess of watery matter and pasewa to drain off. The aggregate of the drug belonging to a cultivator is kept in a shady place in his house, and carefully treated so as not to injure the grain, but to allow the consistence to rise evenly until it has reached the desired degree. The opium is then brought to the district officer at the appointed time and place, and he receives it over by weight on behalf of government, and transmits it to the factory in jars containing 1 maund (82½ lbs.) each, paying to the cultivator a further advance on its value according to his estimate of its assay. The annual amount of opium delivered in the two agencies amounts to perhaps 107,000 maunds at 70' (equal to about 8,900 tons, and for which the cultivator would receive Rs. 21,400,000, nominally 2½ million pounds sterling).

After the collection of the opium has ceased, the plants are allowed to remain standing in the fields till the capsules are quite ripe; these are then collected, and the plant leaves when dry are, in certain districts, gathered and sent into the factory under the name of *trash*, to be used as dunnage in packing the provision opium for China. Trash is paid for in the Benares agency at about 10 annas per maund. The annual out-turn of trash in the two agencies is more than 28,000 maunds.

The opium on arrival at the factory is, after weighing, examined jar by jar by the opium examiner, who certifies to its quality and purity. It then has its consistence determined for each jar by assay on the steam table, and according to its consistence it is stored away in one or other of the extensive ranging store vats in the malkhana or store-house, some of which hold 3,000 maunds. The final payments to the cultivators are made according to the value of the opium as determined by its consistence on assay at the factory.

When a sufficient quantity of suitable opium has been received into the factory, the manufacture of the provision opium for the China market is commenced. The provision is caked at the consistence of 70'; to this end, quantities of opium of consistences above and below 70' are alligated or mixed together in certain proportions so that the mean consistence of the mixture may fall within the limits allowed. Before issue from the caking vats, the opium in them is assayed for consistence, to insure that it does not fall below the caking standard laid down by government.

For each "cake" there are served out the equivalent of a certain weight of standard opium for the central mass, together with a certain measure of "lewa," the equivalent of a fixed weight of standard opium. Lewa is a paste made of opium broken up in water, and is of 52.5% consistence. For each cake is also issued a certain weight of leaf, which is previously damped to make it flexible and non-friable.

In a hemispherical brass cup of about 6 inches diameter, the cake-maker pastes layer after layer of pieces of leaf, which he gums together with lewa until the thickness of the hemisphere of shell in the cup is $\frac{1}{2}$ inch, and over the edges of the mould he allows the free ends of the pieces of leaf in the cup to hang. The opium is then deposited in the centre of the hemisphere of shell in the cup, and over it the overhanging leaves are brought and carefully imbricated and pasted down with lewa, and bound together by fresh portions of leaf, and finally over all one of the finest leaves is pasted on and a complete sphere results. This is turned out of the cup and covered half-way up with "trash," which prevents its sticking to the inside of the porous earthenware cup into which the cake is now put. The cup and cake are put on a shell in a well-ventilated warehouse. Caking goes on from May till July at the rate of about 20,000 cakes per diem. The cakes remain on the racks till they are fit for packing, and each cake is periodically turned about in the cup so that it shall dry regularly and evenly, and preserve its spherical shape.

Packing begins about the middle of November. Previous to the commencement of the season's packing, the chief civil officer or magistrate of the district visits the factory and selects at random out of the whole stock of provision in the factory six cakes for analysis; two are retained at the factory, two sent to the sister factory, and two go to the chemical examiner to government at Calcutta. The results of the analysis of each of these three sets of two cakes (in terms of their morphia, narcotine, and smokable extract) are put on the table at the first sale of the season's opium, for the information of the merchants.

Packing is carried on in fine weather only, and is not practicable in damp, cloudy, or rainy weather. Twenty thousand cakes are packed daily in five hundred chests—forty cakes in a chest—the dunnage used being the "trash" already described. Five hundred chests a day are daily despatched from the factory *en route* for Calcutta, where they are stored in large warehouses under the charge of the Board of Revenue, by whom a certain number are exposed for sale each month on account of the imperial government.

The opium intended for Indian consumption is not made up into balls of 70% consistence; it is exposed in the sun in shallow trays until it has become inspissated to a consistence of 90%, at which point it is melted into cubical cakes of 1 ser, each of which is smeared with poppy oil and packed in two layers of bamboo paper. The cakes are then packed in sixties in mango-wood chests, which are distributed as required to the different treasuries of the N. W. Provinces and the Oudh and Central Provinces.

Opium which on examination at either factory is found to be adulterated or otherwise unfit for manufacture is confiscated, and the morphia and codeia in it are recovered in the laboratory department of the Ghazipur factory. Narcotine used also to be recovered; the demand for it has, however, now almost entirely ceased, and it is no longer prepared at Ghazipur.

"The cultivation of the poppy is popular amongst our cultivators. . . . The certainty of receiving a fixed price for their opium; the payment of advances without interest at periods at which the Asamis are generally hard pressed for funds; the obtaining high prices both for the poppy petals and leaves; the getting advances free of interest for wells and frequently for purchase of bullocks; and the remission of all the advances outstanding if their crop has been destroyed by hail—these advantages and the large profits derived from opium attach the Asamis to the cultivation and make it popular. Hindus of all castes, from Brahmans down to Chamars, and Mohammedans too, cultivate poppy, but the Koeri caste are our best cultivators" (Turnbull).

In one year, for an actual cultivation area of 899,287 bighas (562,054 imp. acres), cultivated by 1,448,508 Asamis, the out-turn of opium at 70% consistence was 107,577 maunds (3,952 tons), for which were paid to the cultivators in hard cash Rs. 21,515,400 (2½ million pounds sterling nominal), besides which 19,872 maunds of leaf and 28,773 maunds of trash were supplied and paid for.

In the same year there were turned out (from confiscated useless opium):

Codeia.....	84 lbs.
Morphia acetate.....	84 "
hydrate.....	282 "
sulphate.....	17 "

—P. A. WEIR, M. B., in *Jour. Soc. Chem. Ind.*, 1889, 446.

[During the discussion of the foregoing paper, the chairman said he would be obliged if Dr. Weir would tell the meeting what was the amount of morphia in the opium. Was the leaf that had been shown round, and which he presumed was a collection of poppy petals, used for any other purpose than covering the opium? Did the said leaf

contain any morphia? A curious fact he had noticed was that the red poppy which was so common in the fields in this country (England), and which bore such a strong smell of opium, did not contain morphia. Why did a Chinaman prefer to smoke opium that contained little or no morphia?

Dr. Weir, in reply to the chairman, said that the amount of morphia in the opium was from 2½ to 5%, that the leaf referred to was not used for any other purpose than covering the opium, and that it did not contain any morphia. The Chinaman preferred to smoke opium that contained little or no morphia because if not used to excess it would do him no harm.]

The Ageing of Logwood.

In some articles on logwood by L. Bruehl in the *Textile Colorist*, a subject of importance to logwood users (as well as druggists) is touched upon, namely, the necessity for the ageing, or mastering, as it is called here, of logwood.

It is well known that logwood, when freshly cut, is of a pale yellowish brown color. On exposure to the air it gradually acquires its characteristic red color, this being due to changes in the coloring principles of the wood, which exist in the wood in three forms: first, as a glucoside; secondly, as hæmatoxylin, a colorless body; and lastly, as the color hæmatin. The glucoside which exists in the wood splits up by some change into a glucose and hæmatoxylin, and this latter body, by oxidation, is transformed into the colored body, hæmatin.

This change occurs naturally, but the process is a very slow one. It can be brought about more rapidly by artificial means, and herein constitutes the process carried out by all dyewood grinders of ageing the logwood, which is done because most dyers think that the darker the wood the richer it is in coloring power, and, therefore, they demand dark wood from the dealers, who naturally supply the demand of the dyers. Now Bruehl states that this oxidized or aged logwood does not yield as fast colors as fresh wood does. After testing samples of wood oxidized in several different ways, he found the unoxidized wood to give colors superior in their power of resisting exposure to light as well as to washing and the action of chlorine.

It may be then asked, Why should logwood be aged if unaged logwood gives better results? Probably the reason is this, that for most of the uses to which logwood is put it is necessary to have clear decoctions, and it is easier to get a decoction from aged than from fresh logwood, and the decoctions, too, look stronger, even if they are not really so. For some classes of goods, blacks, a decoction is by no means necessary, and the wood may be used direct in the dye-bath with much more satisfactory results than if a decoction were used; the color obtained would be more solid and fast; the wood could easily be brushed off the goods after dyeing, and, from some experience, we are of opinion that a decoction made from fresh wood would be found to give much better results than one prepared from many of the extracts which are nowadays so largely used, and the constitution of which is so very doubtful.

Manufacture of Phosphorus.

AN improved method of producing phosphorus consists in treating bones or powdered mineral phosphates with nitric acid. A large proportion of the calcium is then removed from the solution—on the addition of potassium sulphate to liquid—in the form of calcium sulphate. The liquid then contains phosphoric acid and potassium and calcium nitrates. After removing the precipitated calcium sulphate by means of filtration, sufficient mercurous nitrate is added to precipitate the phosphoric acid as mercury phosphate. The phosphate of mercury so obtained is collected and dried, and afterward distilled with carbon, when mercury and then phosphorus are distilled over. The mercury may be reconverted into nitrate to serve as a second charge, and the liquors, after removing the mercury phosphate, yield, on adding more potassium sulphate, a solution from which potassium nitrate can be crystallized.—*Scient. Amer.*

Opaque Etching of Glass.

THE following two recipes obviate the use of expensive fluorine salts usually employed in the preparation of solutions for the opaque etching of glass:

(a) Ten Gm. of soda are dissolved in 20 Gm. of warm water, and 10 Gm. of potassium carbonate in 20 Gm. of warm water; the solutions are mixed, and 20 Gm. of concentrated hydrofluoric acid are added, and 10 Gm. of potassium sulphate dissolved in 10 Gm. of water also added to the mixture. The addition of a small quantity of hydrochloric acid gives a fine granulation to the etched surface.

(b) Four C.c. of water, 1.33 Gm. of pure potassium carbonate, 0.5 C.c. of (dilute) hydrofluoric acid, 0.5 C.c. of hydrochloric acid, and 0.5 C.c. of potassium sulphate are mixed, and the mixture treated with concentrated hydrofluoric acid and potassium carbonate until the mixture produces the requisite degree of opacity.—After *Dingl. Pol. Journ.*, 272, 237.

Assay of Cinchona Barks with Petroleum, etc.

SINCE petroleum or kerosene is now used as the solvent for the liberated cinchona alkaloids by manufacturers of quinine, it would appear proper to use the same solvent in the process of assay. This is, indeed, already done by a number of analysts—for instance, by E. Landrin, who used the following method in the assay of red bark from Java:

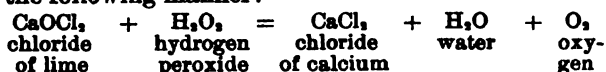
Three hundred Gm. of finely powdered bark are mixed with 75 Gm. of lime suspended in water, and 75 Gm. of a solution of soda of 40° B. The use of both alkalies is essential to complete extraction of the alkaloids. Two liters of petroleum are then added and the mixture heated at 100° C. for about twenty minutes with considerable agitation. The petroleum is decanted off, and the residue treated in a similar manner with a second quantity of 2 liters. The 4 liters of oil are then agitated for ten minutes with 75 C.c. of a 10 per-cent solution of sulphuric acid and 150 C.c. of water, the acid liquor decanted off, and the treatment repeated with the same quantities, and a second time with half the quantities. The first and second acid solutions are heated to boiling and neutralized with ammonia, in order to precipitate the resins, and the third acid liquid, which is used to wash the filter in the first operation, is treated in a similar manner. When the neutralized liquids cool, they deposit, in the form of sulphates, about 90 per cent of the alkaloids present in the bark. The mother-liquids are precipitated with soda, and the precipitate is treated with just sufficient dilute sulphuric acid to convert it into sulphate. The sulphates are weighed together and the different alkaloids separated in the usual way.

The particular *Cinchona succirubra* examined and reported on by the author contained: Total alkaloids, 7.592 per cent; crystalline salts, 5.183 per cent; quinine sulphate, 2.127 per cent.

Water dissolves from the bark the greater part of the acid principles which it contains; alcohol is about equally efficient, but, contrary to the usual statement, it was found that dilute hydrochloric acid dissolves a slightly small quantity.—*Compt. Rend.*, 108, 750 (after *J. Chem. Soc.*).

Generation of Oxygen Gas with Kipp's Apparatus.

PROF. VOLHARD points out that small quantities of oxygen may very economically be prepared, particularly if they are frequently required, by decomposing hydrogen peroxide in Kipp's apparatus. As is well known, hydrogen peroxide and chloride of lime decompose each other in the following manner:



[Note by *Ed. Am. Drugg.*—The actual composition of chloride of lime, which the text-books usually define to be a mixture of calcium chloride, CaCl_2 , and calcium hypochlorite, $\text{Ca}(\text{ClO})_2$, has formed a theme of many important modern investigations, and does not appear to have been finally established beyond argument. The formula above given is that defended by Odling.]

Lunge has utilized the above reaction for the volumetric determination of the active chlorine in chloride of lime. For the preparation of oxygen, this reaction is of still greater importance, since there is given off not only the active oxygen of the peroxide, but also an equally great quantity of oxygen from the lime salt.

At first Volhard attempted to combine the preparation of hydrogen peroxide and its decomposition by chloride of lime into a single operation, by mixing barium peroxide and chloride of lime in proper proportions. This mixture may be formed, while dry, into a cake and pieces, the same as chloride of lime alone when treated with diluted hydrochloric acid; it evolves a powerful current of oxygen mixed with only a very small quantity of chlorine.

Since this method of preparing oxygen may occasionally be found advantageous, Prof. Volhard communicates some practical details.

Of the various commercial sorts of barium peroxide, the cheapest, which is usually designated as "anhydr. techn.," is generally the richest in oxygen. Two samples tested by him contained, respectively, 64 and 71 per cent of BaO_2 . Of the former, 135 Gm. were mixed with 105 Gm. of chloride of lime; of the latter, 170 Gm. were mixed with 130 Gm. of the lime salt. The hydrochloric acid is diluted to a spec. gr. of 1.050. The evolution of oxygen from the above mixture proceeds quite satisfactorily. Nevertheless, the process suffers from drawbacks. In the first place, the evolution of the gas, when once started, continues to the end; and, besides, the mixture of the barium peroxide and lime salt cannot be kept in stock, as it gradually gives off oxygen on keeping.

The reaction between hydrogen peroxide and chloride of lime does not require the presence of an acid. Yet when the liquid after a while becomes alkaline, it separates a sediment consisting of a little ferric oxide with traces of manganic oxides, and this acts catalytically upon the hydrogen peroxide. For this reason, it is preferable to add as much acid as is required to neutralize the free alkali of the chloride of lime. One hundred grammes of a 35-per-cent chloride of lime, which Prof. Volhard employed, after the removal of oxygen by means of zinc dust, required on an average 220 C.c. of normal volumetric acid for neutralization.

It is preferable always to use an excess of chloride of lime. A solution of hydrogen peroxide, containing in one liter 2.88 per cent of H_2O_2 , would require about 170 Gm. of chloride of lime. Better results, however, are obtained by using 300 Gm. of the lime salt, and adding 53 C.c. of crude nitric acid (sp. grav. 1.365) or 57 Gm. of crude hydrochloric acid (sp. grav. 1.170). Under these conditions, the evolution of oxygen is very brisk, and ceases of itself a few moments after closing the stop-cock of the apparatus. The generated gas contains only minute quantities of chlorine.

One liter of hydrogen peroxide containing 2.88 per cent theoretically yields 18.8 liters of oxygen at normal temperature and pressure. In a test experiment, after the air had been driven out from the apparatus, the amount of gas collected in a gasometer, over water of 20° C., amounted to 18.5 liters.—After *Liebig's Annal.*, 253, 246.

Manufacture of Sodium Nitrite.

SODIUM nitrite is one of the most important chemicals used in the manufacture of azo-dyes. There exist several methods for its manufacture, all of which are based on the reduction of sodium nitrate by means of lead. For this purpose, the latter is fused and poured on iron plates in thin layers. After cooling, the lead plates are rolled up and weighed out in parcels for use. The lead should be free from zinc and antimony. The sodium nitrate is then fused in shallow cast-iron pans fitted with a mechanical agitator, and when the mass is thoroughly fused two and a half parts of lead are added at short intervals for each part of sodium nitrate (95-96 per cent NaNO_3). The reduction ensues immediately. The thin leaves of lead fuse easily, and are oxidized to yellow lead oxide (litharge). After some time a further amount of lead is added, as an excess of lead is necessary, and the agitation of the fused mass is continued for at least three-quarters of an hour, in order to obtain a product of high strength. The mass has a tendency to stick to the sides, and great care must be exercised to remove these crusts with an iron spatula, as the slightest inattention causes the burning through of the pan. If the crusts turn reddish, it is a certain sign that the pan is in great danger of being destroyed. These crusts must at once be covered by a fresh quantity of nitrate, and the fire withdrawn if necessary. The whole process of fusion is finished in about three and a half hours. A sample drawn should test at least ninety per cent of sodium nitrite. The mass after cooling is lixiviated in wrought-iron tanks with water or weak liquor. As soon as the solution stands at 36° to 38° B., it is siphoned off and neutralized with nitric acid of 1.029 specific gravity. The liquor is then concentrated to 42° or 43° B., allowed to clarify for three or four hours, and ultimately run into lead-lined wooden tanks. Crystals of a light yellow color quickly make their appearance, which are deprived of their adherent moisture in the customary manner. The mother liquor, in conjunction with other liquors, is again boiled down to crystallization. In this way crystals are obtained of the following percentage:

Sodium Nitrite: NaNO_2 .

	Per cent.
1st crystallization...	95.0 to 95.5
2d "	94.8 " 95.0
3d "	94.2 " 94.5
4th "	94.0 " 94.3

By drying at 60° C. their percentage is increased to 96 per cent. If a purer product be required, it must be recrystallized. Some difficulty is experienced in working up the mother liquor. If crystals of only 94 per cent of NaNO_2 , or below that strength, be obtained, the mother liquors must be concentrated by themselves in pan No. 2. Here crystals, containing 86 to 92 per cent of NaNO_2 , are produced, which are employed for enriching the strength of fresh liquors. If the crystals from pan No. 2 sink below 80 per cent, their mother liquors must be concentrated separately in pan No. 3, whereby crystals containing 50 to 75 per cent of NaNO_2 are obtained. These serve for enriching the liquors in pan No. 2. Weaker crystals are returned to the melting pot and treated with lead.

The lead oxide, obtained as a by-product, is washed, and afterwards converted into the different lead preparations of commerce, or reduced to metallic lead, when it returns to the process.—J. V. Esop in *Zeitsch. f. ang. Chem.* and *J. S. Chem. Ind.*

Preservation of Yeast.

A WRITER in the *Zeitschrift für Spiritus- und Pressehefe-Industrie* (Vol. 9, 287) recommends glycerin as a preservative of yeast. For liquid yeast, he directs to add one-eighth of its volume of glycerin. In the case of compressed yeast, the cakes are to be covered with glycerin and kept in closed vessels. Another method of preserving compressed yeast is to mix it intimately with animal charcoal to a dough, which is to be dried by exposure to sunlight. When it is to be used, it is treated with water, which will take up the ferment matter, while the charcoal will be deposited.

[We have kept both liquid and compressed yeast for a considerable time, without alteration, by saturating the former with chloroform and keeping the latter under chloroform water.—*Ed. AM. DRUGG.*]

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FREDERICK A. CASTLE, M.D.....EDITOR.
CHARLES RICE, Ph.D.....ASSOCIATE EDITOR.

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EDITORIAL

Important Decision Affecting Proprietary Articles.

SOME time ago a number of retail druggists of St. Louis were arrested upon complaint of the Battle & Co. Chemists' Corporation on the charge of selling an imitation of bromidia and labelling it by this title, thus infringing the United States trade-mark laws. Indictments were found against most of them by the U. S. Grand Jury. Some of the accused plead guilty and paid their fines, and the other cases were set down for trial at the September session of the United States District Court. Among the cases thus set down were those of Henry Braun and Frank Sohn. When the cases were called for trial, on Sept. 2d, before Judge Thayer, the accused demurred to the indictment, and the demurrer was sustained by the Court. The cases were thrown out. The cases of the other accused and indicted parties were transferred or certified to the United States Circuit Court, which will be held by Associate Justice Miller of the U. S. Supreme Court, at which time several very important points not covered by Judge Thayer's opinion will come up for decision. One of these is the constitutionality of the act making the counterfeiting of a registered trade-mark a penal offence.

If the decision of Judge Thayer, holding that the proprietors of "bromidia" have no case against the infringers, is sustained by the U. S. Supreme Court, the whole trade in registered, proprietary, and trade-marked articles will be revolutionized and completely altered. In view of the great importance of the issue involved, we quote the decision of Judge Thayer in full :

In the District Court of the United States, Eastern Division of the Eastern Judicial District of Missouri:

The United States vs. Henry Braun. }
The United States vs. Frank Sohn. }

These indictments are under Section 1 of act of August 14, 1878, to punish counterfeiting of trade-marks that have been registered in accordance with the laws of the United States. The section is as follows:

Be it enacted, That every person who shall, with intent to defraud, deal in or sell . . . any goods of substantially the same descriptive properties as those referred to in the registration of any trade-mark, pursuant to the statutes of the United States, to which, or to the package in which the same are put up, is fraudulently affixed the said trade-mark, or any colorable imitation thereof calculated to deceive the public, knowing the same to be counterfeit or not the genuine goods referred to in said re-

gistration, shall, on conviction thereof, be punished, etc. (Vide Vol. I., Supp. R. S. of U. S., page 241).

The law was evidently designed to punish those who, with fraudulent intent, pirate a valid trade-mark which has been duly registered by the Commissioner of Patents. If any person by any means secures the registration of any mark, symbol, word, or device, claiming it to be a trade-mark, which according to the rules of common law is not a valid trade-mark, another person who affixes the same mark, symbol, or device to his own goods, and sells them, cannot be punished under the penal statute above quoted.

Registration does not create a trade-mark, nor is it proof that the person procuring registration has a valid trade-mark. Property in a trade-mark can be acquired only by the adoption of some mark, symbol, sign, or word susceptible of being used as a trade-mark, and by the actual application of same to goods, wares, or merchandise of a certain class, so that it serves to indicate the origin or ownership of the particular commodity. Admission to registration, under act of March 3, 1881, is merely an admission on the part of the government that the applicant for registration is the owner of a valid trade-mark. The certificate of registration granted by the commissioner is only *prima facie* evidence of that fact. It is not a grant of any right or privilege, but merely a recognition on the part of the government of the existence of an asserted exclusive right to affix a certain mark, symbol, word, or device on certain goods as a trade-mark.

Necessarily, therefore, in a criminal proceeding under the act of August 14, 1876, the question whether the trade-mark involved (it having been admitted to registration) is valid, is an issuable question.

It would seem reasonable, therefore, in drawing an indictment under the act, to allege that the person or persons claiming the trade-mark involved adopted the same at a given time and place, and used it in commerce with foreign nations or with Indian tribes on a certain class of goods (describing them) to indicate their origin or ownership, and caused the said trade-mark, on a certain day, to be registered in the United States Patent Office according to law, and that thereafter the defendant, with intent to defraud, dealt in or sold certain goods (describing them) of substantially the same descriptive properties as those referred to in the registration of the trade-mark in question, to which goods, so sold, was fraudulently affixed the registered trade-mark in question, or a colorable imitation thereof, he (the said defendant) well knowing the goods so sold were not the genuine goods referred to in the said registration.

Allegations equivalent to those thus generally outlined appear to me to be requisite to constitute a valid indictment. An indictment ought to allege facts showing the existence of a valid trade-mark, as well as the fact that the registration had been obtained, inasmuch as the registration does not create a trade-mark, and inasmuch as the certificate of registration is at best only convenient *prima facie* evidence that the word or symbol has become a trade-mark. The owner of a trade-mark acquires the same by acts wholly independent of the registration thereof, and registration is not even necessary to entitle him to protection in civil proceedings, although it is necessary to secure the protection of the penal statute.

Tested by these rules, the indictments now in question are bad. They contain no allegations showing that Battle & Co., who appear to have registered the word Bromidia as a trade-mark, ever acquired an exclusive property therein. No acts done by Battle & Co. sufficient in law to give that firm a title to the word Bromidia are alleged. The indictments appear to be drawn on the theory (which for reasons above given I deem erroneous) that it was sufficient in the indictment to show merely that the word Bromidia had been admitted to registration, and that the defendant subsequently sold goods of substantially the same descriptive properties as those referred to in the registration to which was affixed the word Bromidia. An allegation that a word has been admitted to registration by the commissioner is not sufficient averment in a *criminal proceeding* that a certain person has acquired an exclusive right of property in the word affixed to a certain class of goods, because notwithstanding such registration the word may not have become a valid trade-mark, either because the necessary steps have not been taken to make it a trade-mark, or because the word itself for certain reasons is not susceptible of appropriation for that purpose.

These considerations serve, in my judgment, to show the necessity of averring a state of facts which, as a matter of law, is sufficient to make the word a valid trade-mark. Without such averments, a criminal offence is not stated with sufficient certainty.

It is claimed by defendant's counsel that the indictments are bad for various other reasons, and among the number, because the trade-mark law of July 8, 1870, was void, Congress having no power to pass such a law, as was held in the "Trade-mark cases," 100 U. S., 1882, and because, at the time of the enactment of the penal act of August 14, 1876, under which these indictments are drawn, there was nothing upon which that act could operate, and it was therefore nugatory, and remained inoperative even after the passage of the act of March 3, 1881, supra.

It is unnecessary, however, at this time to express any opinion concerning the novel question thus raised, as the indictments must be held bad for the reasons heretofore indicated.

Demurrer sustained.

It is to be regretted that the new *Century Dictionary*, which is justly pronounced a monumental and epoch-making work, has, in one direction, departed from its own expressed rule—page viii. of preface: "it is not the office of a dictionary like this to propose improvements, or to adopt those which have been proposed and have not yet won some degree of acceptance and use." A departure from this rule has been made throughout the work so far published, in the spelling of the chemical terms in *-ide*, the *e* being everywhere dropped in the text. Thus we find *oxid* for oxide, *chlorid* for chloride, *anhydrid*, *dioxid*, etc., etc. The spelling with *-ide* is given with each leading term, as an alternative, but in the body of the text the spelling with *-id* is always used. Compare the article "Carbonic." We are aware that some English-speaking chemists who have been educated on the Continent of Europe have acquired the habit of pronouncing various terms in the German or even French manner, but we are quite certain that all others, constituting the vast majority, pronounce the last syllable of such terms as "iodide, sulphide, anhydride," in the same manner as the *-ide* in "tide," and consequently they will also spell it preferably with an *-e*, and continue doing so, in spite of the authority of the *Century Dictionary*.

Dr. Henry J. Menninger died on Sept. 8th, after a brief illness, at his residence in Brooklyn. His death makes a gap in the ranks of the profession which will long be felt by those who are actively engaged in educational and professional matters. His facile and genial manners and his aptitude in speaking *ex foro* made him the leading figure at many public occasions, and justly so. His loss will long be felt by all who knew him, or with whom he was associated.

He was born near Mainz, in 1838, his father being a prominent physician. Owing to the participation of the latter in the revolution of 1848-49, he was compelled to flee the country and settled with his family in New York City. Henry, the eldest son, was educated in the public schools, and subsequently found employment with McKesson & Robbins. In 1858 he began the study of medicine at the New York Medical College (of the University of the City of New York), from which he graduated in 1861. After the breaking out of the war, he enlisted in the volunteer service, soon advanced to lieutenant, and in the battle of Bull Run commanded a company. He was wounded in the battle of Road Mills, Va., and shortly afterwards appointed surgeon, being attached to the medical staff stationed at Newbern, N. C. During the war he also acted as correspondent of the *N. Y. Tribune*, for which he had already previously been engaged for a time. In 1865 he founded the *Newbern Republican*, and was elected in 1866 Secretary of State of North Carolina. A few years subsequently, after his term of office had expired, he removed North, and established a pharmacy at the corner of Sands and Jay streets, Brooklyn. During the years 1882 and 1883 he held the office of alderman, enjoying the respect of all, owing to his almost aggressive integrity and attention to duty. In 1883 he was elected coroner, which office he held for one term, when he retired from the public arena to devote himself entirely to his business. For many years he has been one of the officers (trustee, vice-president, chairman of examination committee, etc.) of the College of Pharmacy of the City of New York. He was also member of the Kings Co. Medical Society, of the German Apothecaries' Society of New York, of the military order of the Loyal Legion, a member of Germania Savings Bank, an ex-officer and trustee of the American Pharm. Association, and of various other bodies.

"Multis ille bonis flebilis occidit."

Part II. of the "Digest of Criticisms on the U. S. Pharmacopœia" is now being distributed. Attention is called to the request of the Committee of Revision to loan to them complete files of such periodicals as have not been abstracted for Parts I. and II.

The Iodine Trade.

THE *Chemist and Druggist* of September 7th makes the following editorial remarks on the iodine market:

Just as everybody in the drug trade was meditating on the chances of a further drop in the price of this very difficult product, a circular came from Mr. Greenhough, the broker who represents the combination in London, intimating that the price of iodine had been raised from 4d. to 9d. per oz. This was dated on Monday, September 2d. Somehow the impression had got about that this time the quotation was going to 2½d., and a great many clever people had resolved to wait for that eventuality before stocking. Moreover, the combination were refusing orders from brokers and speculators in certain instances. But, for all this, we know on the best authority that a very considerable quantity of iodine has been sold and delivered at 4d. to the legitimate trade, a welcome and not too frequent streak of luck in the well-skimmed business of chemical manufacturing.

With quotations again at what we may regard as the normal figure of 9d., we naturally ask, what are the prospects of stability? Of course, it is well understood that the usual conditions of supply and demand have no influence on the price of this article; it is likely that iodine could be produced and placed on the market at a profit at 2d. per oz., perhaps even at less. The discovery of some new and extensive industrial use for iodine would be almost certain to result in a considerable fall in the price. This may be paradoxical, but it is about true. The producers in Chili and Peru could without much extra cost to themselves send ten times the quantity to Europe which now comes, and if it ever came about that the consumption depended on the price to any material extent, the existing convention would have to go. The vast and probably inexhaustible beds of nitrate of soda, which have been developed with such remarkable energy, especially of late, can furnish as a by-product whatever the world is likely to want in the way of iodine for centuries to come. The salt taken from those beds yields on an average some half per cent of iodide and iodate of sodium; the world's consumption of iodine is estimated at an annual average of a quantity approaching but under 500,000 lbs. The Chilean producers limit themselves for the purposes of the convention to the supply of some sixty per cent of the world's requirements. Any one who knows anything of the present dimensions of the nitrate trade can easily calculate from the figures we have given what a self-denying ordinance this is, or rather would be if it were not for the compensating artificial price.

The recent action of the syndicate in reducing their quotation from 9d. to 4d. has been attributed in many quarters to a wholesome fear of Colonel North, the redoubtable nitrate king. And it was doubtless in view of his possible intervention in the trade that buyers held aloof so much as they did. It was felt that if he and the feudatories whom he influences were resolved to sell iodine for what it would fetch, it would be all up with the "ring." And so it would be; but for the present, at all events, this danger does not exist. Colonel North is just now a warm supporter of the convention policy, and declares himself resolved to abide loyally by its terms. What actually happened is said to have been that a certain nitrate producer, who had formerly been associated with the syndicate, sold his business; but, it seems, kept to himself a certain stock of iodine. This he shipped to London; it came into the hands of a firm of bankers, and by them was intrusted to Messrs. Lewis & Peat for sale. As we have already reported, fifteen kegs were sold publicly at 5d. per oz., and the rest of the consignment was disposed of privately. The question of interest to the trade is whether further consignments from outside producers are probable. Messrs. Lewis & Peat assure us that they have no knowledge at all on this point. "If iodine is sent to us to sell," says Mr. Figgis, "we shall get the best price we can for it, regardless of any combination." Mr. Greenhough, who represents the syndicate in London, seems quite confident that there is but little danger of fresh arrivals, and it is obvious that his principals have abundant means of knowing exactly all movements concerning iodine, and much power of influencing probable competitors. All the same, the recent incident will set people thinking. The West coast of South America is a big place, the nitrate business generally is one which cannot be read quite easily, and, lastly, the period for which the convention was last signed expires with this year. There are uncertainties, to say the least, on the horizon; and that is, perhaps, the only certainty in the business.

Queries Wanted.—At the San Francisco meeting of the American Pharmaceutical Association a resolution was passed requesting the members to propose such queries as they would like to see answered next year. Such queries should be forwarded at once to the chairman of the section on scientific papers, H. M. Whelpley, St. Louis, Mo. Members who have decided to write papers should send the titles to the same address.

The Draft of a new German Pharmacopœia has been completed by the Government Committee. It will be printed provisionally for distribution among competent critics.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,370.—Dorvault's L'Officine (M. F.).

This work has just been published in a new (12th) edition, the contents having been revised and corrected in accordance with the last revision of the codex. You will be enabled to obtain it through the book trade, for instance through J. H. Vail & Co., 21 Astor Place, N. Y.

No. 2,371.—Iodoform Silk (Dr. N.).

This may be prepared by winding a suitable quantity of white silk—twisted or braided, as may be required—loosely over small plates of glass, such as microscopic object glasses, and immersing the plates into a solution of iodoform in ether of the desired percentage—for instance, 10 per cent. The vessel must be carefully closed and set aside for two days. The silk is then removed, wrapped in blotting paper, dried, and kept in well-closed bottles.

No. 2,372.—"Nepenthe" (A Subscriber).

This correspondent has had an English prescription presented to him in which "Nepenthe" was ordered as one of the ingredients.

According to Squire and others, this is a proprietary preparation made at Bristol. It is said that a solution of 3 grains of tartrate (?) and 1 grain of sulphate of morphine in a fluidounce of sherry wine is a close imitation of it. It is intended, presumably, as a substitute for tincture of opium.

No. 2,373.—Chloral-Urethane (M. J. S.).

This is a new hypnotic introduced, or rather first studied as to its therapeutic property, by Huebner and Stricker. It is a compound produced by the addition of one molecule each of anhydrous chloral and urethane (ordinary or ethylic urethane). It is insoluble in water, and decomposed by hot water into its constituents. Whether it will ever play any considerable rôle is more than doubtful, firstly, owing to its insolubility, and second, to its high price.

No. 2,374.—Cement for Aquarium (Detroit).

A good preparation is said to be the following, which is given by Dieterich:

Litharge	20 parts.
White Sand, finest.....	20 "
Plaster of Paris	20 "
Borate of Manganese.....	1 part.
Rosin, powdered	70 parts.
Boiled Linseed Oil.....	suff. quan.

Mix the solids and make them into a paste with the oil.

No. 2,375.—Artificial Brandy.

There are numerous works in which you may find formulas for preparing artificial liquors. We do not believe, however, that many of those which are published are of any mercantile value whatever. Moreover, we do not believe in artificial brandy, and therefore cannot undertake to suggest any formula. We fear, however, that most of the brandy, even that which is imported from the best French localities, is more or less manipulated. Evidence to this effect has been amply furnished by several U. S. consuls in France.

No. 2,376.—Preserving Anatomical Preparations ("College").

According to Grawitz, the following method is to be recommended:

Prepare a solution of 5½ oz. chloride of sodium, 640 grains sugar, 320 grains nitrate of potassium, in 34 fl. oz. of water, and acidulate it by the addition of about 3 per cent of boric or tartaric acid. The object of this acidulation is to convert the hæmoglobin in the specimen into hæmatin. Immerse the specimens in the solution, and then dilute the latter with enough water to cause the specimens to sink. After six to eight weeks the latter will be sufficiently "pickled." They are then transferred to a fresh, colorless solution prepared from the same ingredients.

The process may also be carried out by using the above solution diluted with one-third or one-half of its volume of water. In this case the specimens are covered with the liquid, care being taken that all inclosed air bubbles are expelled, and the vessels completely filled with the liquid, so that it will touch the lid when this is put on.

No. 2,377.—Beef Peptone (H. C. B., Philadelphia).

Prof. J. Bauer gives, in Von Ziemssen's "Handbook of General Therapeutics," Vol. I., p. 88, the following directions, by Leube, for making beef peptone: 1,000 Gm. of beef, freed from fat and bone, are finely chopped and placed in an earthen or porcelain vessel with 1,000 C.c. of water and 20 C.c. of pure hydrochloric acid. The porcelain vessel is then introduced in a Papin's digester, the cover of which is firmly closed, and boiled from 10 to 15 hours, with occasional agitation in the first part of the time. At the end of the fifteen hours the mass is taken out of the digester and rubbed in a mortar till it presents

the appearance of an emulsion. It is then boiled for another 15 to 20 hours, without the lid of the digester being once raised, after which it is treated with pure sodium carbonate almost to neutralization, evaporated to the consistency of a pulp, and divided into four portions, each representing 250 Gm. of the meat.

No. 2,378.—Unguentum Ophthalmicum Compositum ("Licentiate").

This was official in the first German, and is still so in the Swiss Pharmacopœia. It is known as St. Yves' salve. The formula of the Pharm. Germ. I. was as follows:

Yellow Wax.....	24 parts.
Lard	140 "
Red Oxide of Mercury	15 "
Oxide of Zinc.....	6 "
Camphor	5 "
Oil of Almond.....	10 "

The directions are best modified as follows:

Dissolve the camphor in the oil with the aid of a gentle heat, and triturate the metallic oxides intimately with the solution. Then add to it the wax and lard previously melted together and partly cooled, and mix the whole thoroughly.

No. 2,379.—Prescription Difficulty (Z.).

One of our friends sends us the following prescription, stating that it was written by a New York physician, but that its preparation was not a success.

R Chrysarobini.....	3 i.
Gelatini	3 ij.

Dissolve the chrysarobin in the gelatin by means of heat, and add

Vasellini..... 3 iij.

M. Ft. ung.

Our correspondent added enough water to Cox's gelatin, in a capsule, to cover it, and then proceeded as directed. The added water was driven off by the subsequent heating.

The difficulty is this: that chrysarobin is insoluble in water, and that gelatin, which is exceedingly soluble in water, repels or refuses to form homogeneous mixtures with substances which are themselves insoluble in water. The gelatin must be omitted from the above prescription if a homogeneous ointment is to be produced.

No. 2,380.—Prescription Difficulty (H. K. A.).

The following prescription has been presented to one of our subscribers, who wants to know what change takes place:

R Acidi Carbolici.....	gtt. xx.
Bromi.....	gtt. x.
Vasellini.....	3 i.

Misce. Ft. ung.

Bromine is one of the most energetic substances (elements), and seeks to enter into combination whenever there is a possibility of doing so. Among organic substances particularly, there are comparatively few that are able to resist its action. In most cases, at all events, when the substance with which it comes into contact contains any atoms of hydrogen which are replaceable, it takes their place in the molecule. Thus, in the case of camphor, for instance, which has the composition $C_{15}H_{10}O$, there may be either one or two atoms of hydrogen replaced by bromine, according as 1 or 2 molecules, that is, 2 or 4 atoms, of the latter are made to act upon 1 molecule of camphor. It always takes two atoms of bromine to cause the replacement of one atom of hydrogen, because while 1 atom of bromine takes the place of the latter, the other atom combines with the liberated hydrogen to form hydrobromic acid. Thus:



In the case of carbolic acid or phenol, which has the composition C_6H_5O , all the hydrogens can be replaced by bromine, forming C_6H_4BrO , or monobromophenol, $C_6H_3Br_2O$, or dibromophenol, $C_6H_2Br_3O$, or tribromophenol, etc., etc. Under ordinary circumstances, when phenol is brought together with bromine, *tribromophenol* is formed, which usually appears as a whitish precipitate if thrown down in an aqueous solution, but may be obtained in colorless crystals. In the mixture forming the subject of this query, the bromine forms one of these substitution products with the phenol. As to which one is formed depends on circumstances. If the bromine were first treated with a little carbolic acid, and the temperature were above the normal, one of the higher products would be formed. If the bromine were added to the phenol and vaseline previously mixed, one of the lower ones would be produced. At all events, the bromine would disappear, as such, eventually. The vaseline may be regarded as taking no part in the reaction.

No. 2,381.—Oxgall Soap (End.).

This kind of soap, which is but little used here, but is extensively employed in Europe—in Germany it is known as "Fleckseife"—is prepared by combining about 1 part of oxgall with 2 parts of previously well-dried hard soap.

As is well known, bile exerts an important function upon digestion in the living organism, not by true saponification, but by subdividing the fats or oils into the most minute particles, so as to appear almost to dissolve them. In fact, it may be said to remove the antipathy between the molecules of fat and the watery materials with which the latter become mixed. This property of the bile, to subdivide fats and render them capable of forming an emulsion with water, is made use of in various directions. For instance, in painting with water colors, when it is found that the paper will not take any liquid color owing to traces of fat, it is only necessary to add a small proportion of bile to the color, when the paper will at once receive it. Addition of a little bile to certain inks, not containing ingredients which would form precipitates therewith, causes the inks to become fit for writing upon fatty fabrics, skins, etc.

The removal of oil or fat stains from all kinds of fabrics, even the most delicate ones, may, in most cases, be accomplished by using oxgall, either applied in substance and then washed off with warm soap solution, or by using oxgall soap. This may be prepared by melting 2 parts of dried soap with 1 part of fresh oxgall, with or without the addition of a perfume (though this has not much effect). When the mass cools, it is cut into cakes or formed into small balls for sale or use.

By the way, according to Schaedler, fresh oxgall may be kept for a long time without alteration, even in casks, by adding 7 parts of acetic ether to every 1,000 parts of fresh oxgall.

No. 2,382.—Paraldehyde (P. P. L.).

This subscriber asks a series of questions regarding paraldehyde, which we will answer connectedly.

Paraldehyde (also spelled paraldehyd, perhaps preferably) is a so called polymeric modification of ordinary aldehyde (acetaldehyde), in which 3 molecules are combined together to form 1 molecule.

Aldehyde is C_2H_4O ; paraldehyde is $(C_2H_4O)_3$, or $C_6H_{12}O_3$.

In its manufacture, the first step is to prepare pure aldehyde. This is accomplished by oxidizing alcohol by means of bichromate of potassium and moderately strong sulphuric acid. The mixture is distilled, the distillate afterwards warmed to $122^\circ F.$, and the vapors conducted into ether, which is afterwards saturated with ammonia, which causes the formation of a crystalline compound, viz., aldehyde-ammonia. The crystals are warmed with diluted sulphuric acid, which sets the pure aldehyde free, and the vapors of the latter are condensed by cooling. This pure liquid aldehyde is now slowly treated with chloride of zinc (or certain other agents) which causes it to become heated, while at the same time the molecular change takes place. On cooling to $32^\circ F.$, the paraldehyde crystallizes out. The remainder of the liquid is treated again in this manner, until the whole of it is converted and the product has acquired the uniform boiling point of $255.2^\circ F.$ The spec. grav. of pure paraldehyde is 0.992–0.998. At a low temperature it crystallizes, but melts again at $51^\circ F.$ It is soluble in alcohol and ether in all proportions; at $59^\circ F.$, it is soluble in 10 parts of water, which solution becomes turbid on warming, as paraldehyde is more soluble in cold than in hot water.

Water has no effect upon it, and we are not aware why some physicians object to its being dispensed with water, as our correspondent states.

Paraldehyde may be administered in capsules, but preferably in suitable dilution in wine, simple or aromatic elixir, and simple vehicles. A solution of it in any strongly alcoholic liquid is unadvisable, as the effects of the remedy may be modified or neutralized by the alcohol.

It is difficult or impossible to say what would be the average toxic dose. It appears to act, when given in excessive quantities, somewhat like alcohol. In certain forms of mental diseases quite large doses are usually given. How it produces death is not definitely made out. Since it is known that it may be gradually taken in increased doses, and eventually produces secondary symptoms resembling those of alcohol poisoning, it may be supposed to act somewhat analogous to the latter, at least in excessive doses.

We would recommend to our correspondent to consult Loebisch, "Die neueren Arzneimittel," 8, Wien und Leipzig, 3te Aufl., 1888.

No. 2,383.—Methozin, Antipyrine, Analgesine (Subscribers).

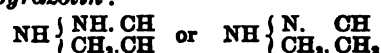
We are asked the question: "Why is it proposed to apply the name *methozin*, which I have encountered in my reading, to antipyrine? Has any physician ever prescribed, or any apothecary ever dispensed it under that name?"

The name "*methozin*" was proposed, and is now and then used—very unwisely, we think—for the purpose of stripping antipyrine of its character of a patented or proprietary article. Antipyrine is, of course, a fanciful name for a certain chemical compound, proposed by a process which is covered by a patent. If any one can produce the same compound by another process, there is nothing to hinder him from doing so, but he cannot call it antipyrine. If the true chemical constitution of antipyrine were known, it would probably be possible to devise a name which would recall its chemical constitution, though it is

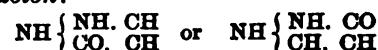
more than doubtful whether the name would be euphonious or practical. The most recent view which Dr. Knorr entertains of the composition of antipyrine is that it is a derivative of pyrazol and that it is to be regarded as *phenyl-dimethyl-pyrazolon*:



By the assumption of two atoms of hydrogen (effected by a certain reaction) this is converted into dihydro-pyrazol or *pyrazolin*:



If one CH_2 group is replaced by CO , the resulting product is *pyrazolon*:



If now, further, one of the hydrogens in the group NH (imidogen) is replaced by phenyl (C_6H_5), and the other by methyl (CH_3), and if, besides, another hydrogen is replaced by methyl—though it is not known exactly in which group or radical this replacement actually takes place—the result will be:



and this is phenyl-dimethyl-pyrazolon, commonly called antipyrine.

Now it would take considerable manipulation to mould the above chemical term into an euphonious "prescription term," without obscuring its meaning. Nevertheless, the new Austrian Pharmacopoeia, which contains antipyrine, and uses *Antipyrinum* as main title, has "*Phenyl-dimethylpyrazolonum*" as a synonym.

And even supposing such a term were found, why should we use it? Is there the slightest probability that the medical profession would generally adopt it? As long as the substance is sold as antipyrine, it will be generally prescribed for, or demanded by the public under this name, and it should be designated by the same name in the standard works of reference, and even in the Pharmacopoeia. Nobody is likely to look either in the text or in the index of such a work under any other name than "antipyrine." By the way, the last edition of the U. S. Dispensatory treats of antipyrine on page 1711, but the name is omitted in the index, which may mislead some users of the work to suppose that antipyrine is not treated of at all therein.

The French have introduced the name "*analgesine*" for it; but it does not appear to have driven the original name out of existence.

The Arsenical Water of Court St. Etienne (Belgium).

In 1872 died J. T. Liboutton, for the previous forty-two years burgomaster of the little town of Court St. Etienne (St. Stephen's Court) in Brabant. He left the greater portion of his fortune to the town, in order that an asylum or almshouse for the aged poor might be built there. The authorities set to work without delay, and in the year 1878 the building was completed. It was called, from the name of its founder, the Hospice Liboutton. A very short time elapsed before it was observed that old people appeared to thrive there in a very remarkable manner; the bloom and freshness of youth returned more or less, replacing the dull pale tints of age; and this occurred so rapidly that it seems to have attracted general notice.

In trying to account for this singular fact, the management of the Hospice came to the conclusion that it could not possibly be due to any special article of diet, for the food taken was of a very ordinary kind; nor were the pure air of the locality and the dryness of the soil considered sufficient to explain the mystery, for mystery it certainly was, and so it remained until suddenly three of the inmates of the establishment died at very short intervals, and within six months of the opening of the Hospice a fourth inmate retired voluntarily from the place, fearing to meet with the same fate as his three companions.

The food, the air, and the soil had been inquired into; at last attention was turned towards the water supplied to the establishment. It was found to be arsenical.

The spring issues near some lodes of mispickel (arsenical iron pyrites), and I find that this water, which is cold, bright, and clear, and has a pleasant taste, yields to analysis 19½ grains of total residue to the imperial gallon. Of these, 0.7 grain is *arsenic acid*, and 0.84 grain ferric oxide, the remainder being composed of the usual compounds of lime, soda, silica, and magnesia found in spring waters. It is supposed to have a constant composition, but to establish this fact it will be necessary to make another analysis at some distant date. Nevertheless, it is supplied to various pharmacies, and is used in medicine as a substitute for Fowler's solution or Bourbole water from the Puy de Dôme (France). It is much richer in arsenic than the water of Mont Doré (Puy de Dôme).

Such is, in a few words, the history of the most recently discovered arsenical mineral spring. The composition of this water and the geological nature of the district—not far from the celebrated plains of Waterloo—do not indicate the remotest connection with any volcanic phenomena.—Dr. T. L. PHIPSON in *Chem. News*.

American Druggist

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On the Poisonous Plants Indigenous to California.*

BY HANS HERMAN BEHR, M.D.

In the present state of our knowledge, the enumeration of the dangerous plants in a new country like California seems to partake somewhat of procrastination; but a beginning has to be made, and the circumstance of our very fragmentary knowledge, when exposed to the view of the profession, will act as a stimulus for the investigation of a matter of such vital importance.

Let us first consider those plants of whose dangerous qualities we might be convinced *a priori*, or which at least belong to genera where analogy with foreign species of the same genus or order justifies us in considering them dangerous.

We have two species of a cucurbitaceous genus, exhibiting a full measure of all the drastic properties developed by some other members of the order, namely, *Megarrhiza* (according to some botanists, *Echinocystis*) *fabacea* and *Marah*, both species comprised under the vernacular name of *Manroot*.

The active principle seems to be most developed in the enormous rhizome. The presence of this active principle is the more to be regretted as otherwise the considerable amount of starch contained in these rhizomes would make both of the species valuable food plants, like the yam of the tropics, to which the slender climbing stem proceeding from a giant rhizome bears a kind of external resemblance.

The intense bitterness of the rhizome warns the curious in time and prevents accidents. The stem and leaves seem to be inert. The prickly capsule is full of a saponaceous juice, which disappears with the ripening. Neither the properties of the saponaceous juice nor those of the seeds have been thoroughly examined, and a close investigation may lead to the discovery of some new principle. In the meantime we must suppose that these parts bear an analogy to *Colocynthis*, in the same way as the rhizome coincides in many points with the root of *Bryonia alba*.

We have a species of *Gratiola*—*Gratiola ebracteata*—but it is doubtful if this little and rather rare annual possesses any of the properties that have given its European congener, *Gratiola officinalis*, its botanical name and its reputation amongst the farmers of the old Continent.

We have two species of *Solanum*: *Solanum nigrum*, the common nightshade; it is not poisonous in California, at least under ordinary circumstances. The same species is common in Europe, where it is considered poisonous.

The second species, *Solanum umbelliferum*, has not yet been sufficiently investigated. Stem and leaves may act like those of *Solanum Dulcamara*, the bittersweet of our stores, which it resembles. As to its berries I have no data.

Datura Stramonium (thorn apple) is common enough in some localities, and does not differ in any way from specimens derived from other countries.

Our beautiful *Rhododendron occidentale*, frequently called *Azalea*, contains in its roots a narcotic principle not yet sufficiently investigated. It may be that the leaves partake of the active principle contained in the leaves of the Siberian *Rhododendron chrysanthum*.

Ledum glandulosum (Labrador tea) deserves to be investigated as a narcotic. It resembles *Ledum palustre* so much that we may expect the same active principle which in mediæval times was used to make beer more intoxicating, and the prohibition of which for this purpose is one of the first instances of a sanitary law. The leaves at present are only in use for killing vermin on cattle, and fleas that infest rural abodes.

Caucalis nodosa and *Caucalis microcarpa* (*yerba de vivora*) are firmly believed by our old settlers to be infallible remedies for the bite of the rattlesnake. If they really cure snakebite, or at least diminish its danger, they must possess a power that under ordinary circumstances might do harm. Both the plants comprised under the name *yerba de vivora* are insignificant-looking annuals, and perhaps owe their reputation to the circumstance that they are strictly vernal and not to be found where snakes are most likely to be met with. But we must not judge *a priori*; investigation may reveal powers which we did not expect in the herb.

The odor of *Heracleum lanatum* (cow parsnip) causes vertigo in some persons. Although these effects are neither constant nor general, an investigation is recommended, as it is of importance to know the properties of an herb of so frequent occurrence in the neighborhood of habitations.

Our *Oenanthe Californica* (fool's parsnip), notwithstanding

ing its great resemblance to *Oenanthe fistulosa* of Europe, seems not to be poisonous.

Sium cicutæfolium (water parsnip) is decidedly poisonous, and the more dangerous as the taste of its root resembles that of parsnip more than any other of the poisonous umbelliferæ. It is probably this plant that caused the disaster of Coyote Creek in the year 1869, where, of a party of six prospecting miners, only three escaped with their lives.

We have three species of *Cicuta* (water hemlock), all of which, if not poisonous, are at least suspicious. As they are generally found in marshes or in otherwise not very accessible places, they are not apt to cause accidents.

It is not certain that *Conium maculatum* (the spotted hemlock) is originally a native herb. At present it is very common, and in some localities forms thickets, whose nauseous smell is apt to affect sensitive constitutions. The disagreeable smell, however, serves as a kind of warning and prevents accidental poisoning.

Eremocarpus setiger is used by the Indians to narcotize fish. Its properties otherwise are but imperfectly known. It smells like strawberries, but its dusty, straggling appearance is not calculated to invite passers-by and so cause accidents.

Another euphorbiaceous plant, *Hendecandra procumbens* (*Croton Californicus*), is a powerful drastic.

Our native species of *Euphorbia* are annuals, and I do not think that their milk is acrid enough to do harm, but *Euphorbia Lathyris*, a kind of spurge introduced from Europe, is a powerful drastic in all its parts. Rats do not like to dig in the ground where this plant grows in sufficient numbers.

Rhus diversiloba (our poison oak or yedra) cannot well be called a poison, as no case is known where this shrub and its exhalations have caused more than the temporary trouble of a skin eruption. All the cases where the eruption became permanent admit of the explanation that a predisposition for cutaneous troubles existed which would have developed sooner or later without having received a start by the action of poison oak.

There does not seem to be anything specific in the action of the shrub. Many people are affected in a similar way by inhaling the vapor of turpentine on visiting a newly painted room. Our poison oak, as well as the *Rhus Toxicodendron* of the Atlantic States, requires an idiosyncrasy in the individual to act upon, or else it remains inert. I have remarked the same peculiarity in the case of the dreaded *Semecarpus* of the East Indies, and I should not wonder if the terrors of *Rhus caustica* in South America and of the *Melanorrhœa* (the Japanese varnish tree) rest on a similar exaggerated action, and would by a close investigation resolve themselves into an inconvenience befalling only those who are liable to be affected in that way.

As to antidotes, there exists no specific for the cure of the eruption if it is once fairly established. The exanthema has to be treated according to general rules. Nevertheless there seems to be a foundation in the belief of our fellow-citizens of Spanish descent that an infusion of the leaves of *Rhamnus Californica* (*Cascara sagrada*), used as a wash, acts as a preventive. But as this remedy, to be of any use, must be applied before the eruption has developed, and as the receptivity for the noxa in the majority of people is altogether wanting, it is difficult to judge about the merits of the application. It is true that I know of a few cases of persons formerly liable to be affected who have been exempt since they have used the wash immediately after each exposure.

The second California species of *Rhus*, *Rhus aromatica*, is entirely harmless, and its berries are edible.

Actæa spicata (baneberry) is rather local. The beautiful coral-red berries look inviting enough, but I have never heard of any accident.

A species of *Delphinium* is dreaded by herders, who frequently lose sheep by this plant, but it is difficult to identify the species from their vague descriptions. All we can make out from their statements is that it must be a perennial, growing, when in flower, above the height of a man.

Our species of *Ranunculus* lose their poisonous acidity by drying, so that the hay is not affected by their presence.

It is the reverse in regard to our *Prunus ilicifolia*, a kind of wild cherry, whose foliage develops its poisonous properties only during the process of withering. This peculiarity causes occasionally the loss of a sheep or a cow, because these animals acquire the habit of browsing on the trees that grow near the trail that leads to their pasture grounds, and do so with impunity, until some day they encounter in a tree, on which they have browsed every day, a branch that, perhaps in consequence of an injury, has begun to wither.

* Paper read at the meeting of the American Pharmaceutical Association at San Francisco.

The notorious Loco weed is an *Astragalus*, but the exact species is not known with certainty. There may be several species of *Astragalus* that develop a curious poison of exceedingly slow action, corresponding in some way in its effects to a poison observed in some Australian plants of the same leguminous order, belonging to the genera *Gastrolobium*, *Oxylobium*, and *Isotropis*.

Here, as well as in Australia, these plants have been experimented with, but without enabling the investigator to come to any decisive conclusions. Two things, nevertheless, in both countries have been established:

1. Dogs, cats, and rabbits do not suffer if the seeds or herb of these plants are mixed with their food.

2. Cattle, sheep, and horses suffer only in certain seasons.

As to the first circumstance, respecting the established fact that cats, dogs, and rabbits enjoy an immunity in regard to this poison, we only have to recollect that goats eat hemlock, and rabbits belladonna, with impunity, and we will understand that the immunity of these animals does not prove anything as to the dangerous qualities of the same herb in regard to cattle, sheep, or horses.

The other circumstance, that the Loco poisoning only takes place under certain circumstances, and not in every season, admits of several hypotheses. The poisoning may be owing either to the invasion of some fungoid parasite, perhaps of the *Claviceps* order; or to a substance produced by fermentation or putrefaction, in which case the materia peccans would be some ptomaine; or, lastly, the poison may not be of vegetable origin at all, but some animal parasite infesting the suspected plant.

The question is a very complicated one, and as Loco poisoning in some years entails a perceptible loss of stock, it is of sufficient importance to justify an appropriation for a body of scientists to inquire into the causes of the malady and find a remedy for them.

The ptomaine hypothesis would explain the curious slow action and chronic course of the Loco disorder in the affected animals.

In the *American Journal of Pharmacy* (May, 1880) I find a notice to the effect that the efforts of the government of the Australian colony of Victoria to unravel the mystery have brought the matter a step nearer to the discovery of the real cause of these accidents. My old friend, Baron Ferdinand von Mueller, combining his efforts with those of the accomplished chemist, Mr. Rummel, has discovered a peculiar resin and a glucoside in the Australian herbs, which latter is probably the cause of the poisoning.

Polygonum nodosum, an aquatic species of knotgrass, resembles its European congener in appearance and taste; and *Polygonum hydropiper*, which from its acrid, pungent taste has been named water-pepper, is considered dangerous.

Our two species of *Trillium* (wake-robin) are suspicious and should be investigated.

The same is desirable in regard to our three species of *Fritillaria* (chessboard flower), notwithstanding the statement of the Russian traveller and scientist, Pallas, that the inhabitants of Kamschatka eat with impunity the bulbs of our *Fritillaria laniculata*, that is found in their country as well as in California.

We have in the Sierras two species of *Veratrum* undoubtedly poisonous.

In regard to *Zygadenus venenosus*, the qualities are not sufficiently known. It is certain that the root is as little poisonous to hogs as hemlock is to goats; but in Oregon and Northern California, where the edible bulb of *Camass* (*Cyanotris esculenta*) forms an article of food to Indians, and frequently occurs in company with *Zygadenus*, the latter is called Death-Camass. [See paper on "*Zygadenus Nuttallii*," by J. U. and C. G. Lloyd, in *AM. DRUGG.*, 1887, 141.—*ED. AM. DRUGG.*]

As to *Lolium temulentum*, the darnel, it is still undecided if this grass is poisonous at all times, or only becomes so under certain circumstances.

In regard to poisonous fungi, it is a curious circumstance that all California species that could become dangerous belong to the *Agaricus* group. All the fungi of this group can easily be distinguished by their possessing gills underneath their umbrella-shaped stroma or heads. It is true that not all of these fungi are poisonous, and some of our best table mushrooms belong to this order, viz., *Agaricus campestris*, sold in our markets and cultivated for this purpose.

The danger existing in the wild species of *Agaricus* is that the wholesome and the dangerous resemble each other so much that it takes the experienced eye of the collector to distinguish between them.

All the California fungi not belonging to the *Agaricus* order are either uninviting by smell and appearance (such as the *Phallus*), or are entirely harmless and wholesome food, viz., the *Boletus* and the much-calumniated *Puffball* (*Lycoperdon*), of which we have here a giant species.

The present essay, as I stated in the beginning of this article, is only intended to draw attention to this most important part of our flora, medicinal and pharmaceutical, and in the hope that further investigation may be made into the hidden treasures which may be revealed by a study of the poisonous plants of California.

Nux Vomica—Assay of its Pharmaceutical Preparations.*

BY H. W. SNOW, PH.C.

1. Estimation of Strychnine and Brucine in Mixture.

SINCE the publication of the exhaustive investigations into the botany, pharmacy, and chemistry of *nux vomica* by Messrs. Dunstan and Short, pharmacists have displayed considerable activity in pursuing the investigations which were thus begun, so that at the present time there is a very considerable amount of information to be found concerning the assay of this drug and its preparations. The estimation of total alkaloid in the tincture, fluid extract, and solid extract, the three prominent pharmaceutical preparations of the drug, is a matter of ease and accuracy, and no pharmacist need be deterred from undertaking their assay through mistaken ideas on this point, though it is true that an analytical balance is essential. A sufficient number of assays of the tincture and of the solid extract have been published from time to time to have pretty well settled the maximum, minimum, and average percentages of alkaloid which they contain, and thus to enable, if it is so desired, the next pharmacopoeial committee to adopt alkaloidal standards for them. Assays of fluid extracts have, however, been less numerous, and the writer has collected such as have come within his notice, and added thereto some from his own experience which may thus be found serviceable.

The fluid extract may be assayed (and the tincture similarly by evaporating 25 C.c. to 10 C.c.) by diluting 5 C.c. to 50 C.c. with water, adding water of ammonia, and washing out the alkaloid with three or four successive portions of chloroform. From the mixed chloroform solutions, evaporated, if need be, to a convenient bulk, remove the alkaloid by washing with dilute sulphuric acid in two or three successive portions. From this solution again take up the alkaloid (after rendering alkaline by ammonia) with chloroform, evaporate to dryness, again dissolve in chloroform, and transfer carefully, with washing and without filtering, to a weighed beaker, evaporate to dryness at 100° C., and weigh the mixed alkaloids. The second solution in chloroform is made for the purpose of leaving behind the small amount of ammonium sulphate which is almost invariably transferred with the chloroform in drawing it off. Drying must be thorough, as it not infrequently happens that small amounts of chloroform are mechanically retained in the alkaloid and not easily driven off by slight heat.

The solid extract (about 1 Gm.) may be dissolved in water with the aid of a little ammonia and warming, diluted to 40 C.c., and treated the same as the fluid. Further details of assay will not here be given, but following this paper is a short bibliography on the assay of the drug and its preparations, as contributed from 1881 to date. A. B. Lyons has given us a record of six assays of fluid extracts showing a range of 0.60% to 1.6%, with an average of 1.05% of total alkaloids, and the committee on adulteration of the New York State Pharm. Assoc.† gave assays of six samples showing unusual uniformity in strength varying from 1.8% to 1.2%, with an average of 1.5%.

The following is a record of eight assays taken from my own notes, 0.58%, 0.92%, 1.35%, 1.47%, 1.98%, 2%, 2.04%, 2.54%—average 1.61%. W. Simonson has given us the results of assays of thirty-four powdered extracts, showing as low as 2.24% and as high as 18.9%, with an average of 12.8%, though the general average, excluding the unusual extremes, would show a somewhat higher percentage. A limited number of assays, made by the writer, of powdered extracts of the drug, give a slightly higher average than this, and show the powdered extract to be not greatly inferior to the pilular extract, which has been shown to average about 15% of alkaloid.

2. Separation of Strychnine and Brucine.

Though the estimation of the total alkaloids of *nux vomica* is a simple task, it is not so in the case of the separation of strychnine from brucine.

Dragendorff, after trying published methods, concluded that there was no known process for their separation on an analytical scale with satisfaction, and therefore recommended an indirect method depending on the different titration equivalents of the two alkaloids with Mayer's reagent. This reagent for an equal volume precipitates more brucine than strychnine; consequently less of the reagent would be required to precipitate the alkaloid, if it were all brucine, than would be required if it were all strychnine. Thus, in titrating a known weight of the alkaloid, if less reagent is required to precipitate it than would be the case with an equivalent weight of strychnine, and more is required than would be the case if it were all brucine, a mixture of the two would be inferred, and their relative quantities would be in proportion to the amount of reagent required and the titration equivalents of the two alkaloids. This process has been called into question, and the writer can bear further testimony to its worthlessness.

In the first place, the equivalents accepted were those

* Paper read before the Michigan State Pharm. Assoc., Sept., 1889.
† *Drug. Circ.*, 1886, 178.

given by Mayer himself, and that for brucine has since been shown to be far from correct. Three or four titrations were, however, performed with a view of adopting the later and corrected equivalents of brucine in the calculation, but the results were negative and further experiment was abandoned as useless. Brucine is too fickle in its behavior with this reagent to make it at all a reliable means of assay. Dr. Lyons has proposed* to estimate the proportion of strychnine in the mixture of the alkaloids by determining the *weight* of the precipitate with Mayer's reagent from a known weight of the alkaloids. Whether this is an improvement on the volumetric method has not yet been fully determined. Dunstan and Short's recommendation for separating the alkaloids by precipitation of strychnine with ferrocyanide of potassium, under carefully prescribed conditions of acidity and dilution, was early called into question by Schweissinger,† who found that he always obtained more strychnine and less brucine than he commenced with. In a series of some eight or ten experiments performed a little over two years ago, the writer was unable to substantiate the experiments of the authors of this process. It was found that washing "until free from bitterness" was not a reliable criterion to judge by, as in the first experiments washing, though discontinued before freedom from bitterness was obtained, was excessive. The strychnine obtained was less in amount than was started with, but still was contaminated with brucine. Later experiments with more moderate washing yielded results too high in strychnine and too low in brucine, and the strychnine was always contaminated with brucine, as shown by the nitric acid test. It thus appears that the solubilities of the ferrocyanides of these two alkaloids, under the conditions prescribed, are too near together to make it a close means of separation. Holst and Beckurts‡ have published a volumetric modification of this assay which they claim to be preferable to the original. The authors maintain that in adding the ferrocyanide to solutions of the mixed alkaloids the strychnine is precipitated first, and the brucine only comes down when an excess of precipitant has been added. The assay is carried out by adding to a solution containing from $\frac{1}{4}$ to $\frac{1}{2}$ of the mixed alkaloids hydrochloric acid to distinctly acid reaction. Then run in, in small amounts at a time, a solution of ferrocyanide of potassium of known strength until a filtered drop of the fluid produces a stain on paper impregnated with ferric chloride. From these data calculate the strychnine. This process seems well worthy of attention, but the writer has not yet had opportunity to verify it and has seen no further reports on it. Schweissinger§ has recommended an indirect method for the estimation of the alkaloids by titrating a known weight of them with standard acid and alkali, using litmus as an indicator. This process seems to be well thought of, and in use by some chemists; but it is difficult to get an indicator which is sufficiently sensitive, cochineal, litmus, and methyl orange having been tried with little success. Separation with absolute alcohol was tried but abandoned by Dragendorff|| as an analytical process, and it was also the experience of Dr. A. B. Prescott,¶ with alcohol of spec. grav. 0.941 (39.3% abs. alcohol by weight), that the separation was not sufficiently close for analytical purposes. With alcohol of spec. grav. 0.970 (21.31% abs. alcohol by weight) he found 2.617 parts necessary to dissolve 1 part of strychnine and 37.3 parts to dissolve 1 part of brucine. This degree of concentration he recommends, and doubtless it is one of the best yet offered. In this connection the writer wishes to record a series of negative experiments on the estimation, volumetrically, of the chlorine contained in the chlorides from a known weight of the alkaloids, making this the basis of an indirect determination of them. They were dissolved in a little chloroform, and chloroformic solution of hydrochloric acid was added until slightly acid. The solution was then evaporated repeatedly with fresh chloroform and alcohol in order to free the alkaloids from mechanically adhering acid. The chlorides, when dissolved in water, were titrated with silver nitrate ($\frac{n}{135}$), using potassic normal chromate as an indicator. The reaction seems to be progressive, and, with the dilute standard solutions required, it was not possible to arrive at the end reaction with a sufficient exactness to enable calculations approaching the truth to be made. Repetition of these experiments at a later period confirmed the first opinions. It was again tried, using Volhard's sulphocyanide method of estimating the chlorine. This is carried out by adding an excess of silver nitrate solution, shaking vigorously, and, after adding a few drops of ammonio-ferric alum as an indicator, titrating back with ammonium sulphocyanide; but results were no better. The molecular weights of the two alkaloids are close together, being respectively for strychnine and brucine 334 and 394, with a difference of only 60; and 9.151 parts of strychnine will combine with 1 part of hydrochloric acid, while 10.794 parts of brucine will combine with the same amount. The difference between them is therefore slight,

and, as the alkaloids are usually presented, under the conditions of assay, in small amounts, this necessitates any indirect process to be of great accuracy and precision in order to be of any value. Volumetric methods require very dilute standard solutions and indicators, and these latter seem to be difficult to obtain of sufficient sensitiveness, especially in the acidimetric determinations.

Dunstan and Short: Nux Vomica, drug, Pharm. Jour. and Trans., [3] xiii., 685; [8] xv., 156 [Year Book, 1883, 283; AMER. DRUG., 1883, 124]. Nux Vomica, extract, Pharm. Jour. and Trans., [8] xiii., 443 [Year Book, 1883, 475; 1884, 278; Amer. Jour. Pharm., 1883, 268]. Nux Vomica, tincture, Pharm. Jour. and Trans., [3] xiv., 292; [8] xiv., 441 [Year Book, 1883, 476; AMER. DRUG., 1884, p. 5]. Nux Vomica, standard extract, Pharm. Jour. and Trans., [8] xiv., 621 [Year Book, 1884, 274; Drug. Circ., 1884, 52]. Nux Vomica, standard tincture, Pharm. Jour. and Trans., [8] xiv., 622 [Year Book, 1884, 278; Drug. Circ., 1884, 52]. Lyons, A. B.: Nux Vomica, extract, tincture, etc., Proc. Mich. S. P. Ass., 1885, 172 [Drug. Circ., 1885, 258]. Nux Vomica, drug assay, Drug. Circ., 1886, 187.

Conroy, M.: Nux Vomica, tincture, Pharm. Jour. and Trans., [8] xiv., 461.

Dieterich, E.: Nux Vomica, extract assay, Amer. Jour. Pharm., 1887, 179; Year Book, 1887, 244. (From Pharm. Centralhalle.)

Schacht, G. F.: Mayer's reagent for estimation of total alkaloids in tinctures, etc., Year Book, 1884, 275. (See also Lyons, A. B., and Drug. Circ., 1886, 187; Snow, H. W., Proc. Mich. S. P. A., 1888, 114, for titration equivalents of mixed alkaloids.)

Simonson, W.: Nux Vomica, powdered extract, Pharm. Era, 1888, 277; AMER. DRUG., 1888, 122.

Yerger, E. J.: Nux Vomica, tincture, U. S., Amer. Jour. Pharm., 1886, 291.

Passolt, H. A.: Nux Vomica, tincture, U. S., Proc. Mich. State Phar. Assoc., 1888, 101.

[Gerock's method of separating strychnine and brucine by means of nitric acid probably came to the author's notice too late. It would appear, from the discoverer's analytical data, that it is the best so far known. See AM. DRUG., 1889, 91 (May).—Ed. AM. DRUG.]

Active Constituents of Rhamnus Purshiana.*

BY AUG. C. ZEIG, PH.C.

RHAMNUS PURSHIANA is a native of California, or, more properly speaking, of the Pacific slope. Its name was given in honor of Frederick Pursh, the renowned Prussian botanist, who in 1814 gave a full description which fixed its place in botany, his investigation having been made upon specimens obtained directly from the habitat.

This drug was first brought to notice by Dr. Bundy, and was called Cascara sagrada by the early Mexican settlers in California, the term meaning holy bark. It is now principally known in the Western States as chittam bark.

A good deal has been said of late in various journals of pharmacy concerning this drug, as well as some of its galenic preparations. The high price which it has commanded in the drug market the past year induced a great rush in gathering the same, and has had a great tendency to bring on the market a drug much inferior in quality, by having been gathered out of season; and again it has had a tendency to bring on the market a substitute or adulterant (a species of alder, as F. A. Beckett says), which, although quite similar to cascara in appearance and taste, is of no value whatever as an aperient, for it does not contain the active constituents present in Cascara sagrada.

As to the chemical constituents of Rhamnus Purshiana, I shall call attention to what investigators have contributed to our knowledge through their reports in the various journals of pharmacy. Prof. A. B. Prescott gives in the *American Journal of Pharmacy* for 1879 (see list of references at the close of the article) the result of his investigations, both microscopic and otherwise, among which he reports the presence of three resins—a brown, a yellow, and a red resin—a crystallizable body, three vegetable acids, as tannic, oxalic, and malic acid, both a fat and a volatile oil, wax, and starch. In addition to this, Prof. Wenzel states in the *Pharmaceutical Journal* of 1886 that he has obtained a substance which he describes as being of a deep orange-red color, namely, a glucoside. Messrs. Meier and Webber report in the *American Journal of Pharmacy* of last year, as a result of their investigation, the presence of a vegetable ferment, glucose and traces of ammonia, while Dr. Eccles reports in *Druggists' Circular* for 1888 having discovered the presence of an alkaloid which he states he has separated from the fluid extract and precipitated with Mayer's reagent.

Its extensive use in practice, especially in the form of the fluid extract, has amply confirmed the fact that the drug possesses decided laxative properties. Furthermore, it is set forth by some and denied by others that it also possesses tonic properties. To which of these constituents just enumerated could the laxative and tonic powers of cascara be due?

Messrs. Parke, Davis & Co. were kind enough to send me a sample of the drug, and I undertook to estimate the quantity of the different resins present, and by physiological experiment ascertain as to which is the most active. Furthermore, I undertook to make out a working formula for obtaining the resin in a concentrated form.

* Drug. Circ., 1886, 187.

† Ph. Jour. and Trans., [8] xvi., 447; AMER. DRUG., 1886, 230, both from Archiv der Pharm., [8] xli., 539, 609.

‡ Drug. Circ., 1887, 104, from Pharm. Centralhalle.

§ Where last cited.

|| Plant Analysis, Eng. ed., 1884, p. 191.

¶ Proc. Amer. Phar. Assoc., 1878, 806.

* Paper read at the meeting of the American Pharmaceutical Association at San Francisco.

The method suggested by Mr. Wise, in *Western Druggist*, was first employed for the separation of the three resins. A fluid extract was prepared, using strong alcohol as a menstruum. To this fluid extract was added an equal volume of ether, the mixture agitated and allowed to stand for twenty-four hours.

The ethereal liquid was then decanted and strained, the precipitate washed, dried, and weighed. The product consisted of a red resin, soluble in alcohol and insoluble in ether. The amount of this resin obtained from 114 Gm. of drug was 6.15 Gm., which by physiological experiment appeared to be quite inert.

The ethereal liquid was next evaporated to a somewhat syrupy consistence, seventy per cent alcohol was added, and the whole allowed to stand for some time. The alcoholic solution was then strained and the precipitate washed and dried. This precipitate consisted of a yellowish-brown resin, odorless, but having a slightly bitter taste. The quantity obtained from 114 Gm. of drug was 1.23 Gm. By physiological experiment this portion showed itself quite inert.

The strained alcoholic solution obtained as stated in last paragraph was then evaporated to a dry syrupy consistence, and slowly decanted into water acidulated with hydrochloric acid. The liquid was now strained, the precipitate washed and dried. This consisted of a third resin, of a dark brown color, giving an intense purple with potassium hydrate, having a somewhat bitter taste, and an odor much like the odor of the drug. Physiological experiment showed that it is the most active resin of the drug.

The next thing in view was to obtain some cheap and practical formula for obtaining this resin in a concentrated form. The method suggested by Mr. Wise for separating the resins is open to but one special objection, namely, that of being too expensive a method, as it employs the use of a large quantity of ether as a precipitant. Various other precipitants were tried instead of ether, but without success. Finally I found that by using dilute alcohol as a menstruum in percolating the drug, very little of the inert resin is dissolved, and the use of ether as a precipitant may be avoided. As a formula for obtaining the active resin, I would recommend the following:

Rhamnus Purshiana	8 oz.
Dilute Alcohol,	
Water,	each q. s.
Hydrochloric Acid	2 fl. dr.

Moisten the powder with 8 fl. oz. dilute alcohol, pack it firmly in a cylindrical percolator, and add enough dilute alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for twenty-four hours. Then allow the percolation to proceed, gradually adding dilute alcohol until 12 fl. oz. of percolate are obtained, or until it produces but a slight turbidity when dropped into acidulated water. Evaporate off the dilute alcohol upon a water-bath until the percolate is reduced to a syrupy consistence, and pour it slowly with constant stirring into 8 fl. oz. of water containing the hydrochloric acid. Let stand until the precipitate has subsided, then decant the supernatant liquid and wash the precipitate three times by decantation with fresh portions of cold water. Spread it on a strainer, and, having pressed out the liquid, dry the resin by exposure to air at a gentle heat. This resin dissolves in potassium hydrate, giving an intense purple color, which disappears upon acidulating with hydrochloric acid, when the resin is again precipitated, and may in this manner be obtained devoid of bitterness. Five grains of this resin, a bitter resin, had a marked laxative effect upon an adult.

Now, as to the glucoside mentioned—which, according to Messrs. Meier and Webber, seems to be peculiar to *Rhamnus Purshiana*, as these authors were unable to determine its presence in *Rhamnus Frangula* as found in the market—it may be regarded as one of the important constituents of the drug, and the source of an intensely bitter principle (Meier and Webber), to which, no doubt, the tonic property is due. It may, according to the above authors, be obtained in quite a pure state for examination by making an aqueous percolate of the drug and precipitating with a solution of subacetate of lead. The excess of lead may be removed by passing hydrogen sulphide into the solution, precipitating the lead as a sulphide, and filtering. This filtrate shows decided chemical change when boiled with sulphuric or hydrochloric acid, giving off a peculiar odor. When examined with the aid of a microscope, there is visible an oily and resinous substance with small crystals distributed through it. This resinous substance appears to be soluble in alcohol or potassium hydrate, and insoluble in water. With potassium hydrate it turns a reddish brown. As the glucoside is capable of decomposition when treated with acids in a test tube, it would likewise be capable of decomposition in the gastric juice of the stomach (Meier and Webber), which contains two-tenths of one per cent of hydrochloric acid.

The resins, as has been stated before, may be obtained devoid of bitterness, while the glucoside is in itself not bitter (Meier and Webber), but is the source of the bitter

principle when treated with acids; therefore it appears possible that there may be made a preparation of *Cascara sagrada* quite tasteless, yet containing all the active constituents to which both its laxative and tonic properties are due.

[The following is a list of references on the constituents of *Rhamnus Purshiana* (*Cascara sagrada*):

- Prescott, 1879: New Preparations, Detroit, 3, 27; Am. Jour. Phar., 51, 165; Archiv der Phar., [3] 15, 547.
Wenzell, 1886: Phar. Rundschau, 4, 79; Proc. Am. Phar. Assoc., 34, 462.
Limousin, 1886: Phar. Jour. Trans., [3] 15, 615.
Wise, H., 1885: Western Druggist, 7, 125.
Eccles, R. G., 1888: Druggists' Circular, page 54, March; Proc. Am. Phar. Assoc., 36, 402.
Schwabe, P., 1888: Archiv der Phar.
Meier and Webber, 1888: Am. Jour. Phar., 60, 87; Proc. Am. Phar. Assoc., 36, 400.
Fuge, H. D., 1889: Phar. Jour. Trans., [3] 18, 736 (galenicals).]

Medicinal Plants of the Argentine Republic.

THE crude drugs recently exhibited in Paris by the Argentine Republic attracted attention not only by their great variety but also on account of the excellent manner in which they were presented. A correspondent of the *British and Colonial Druggist* gives the following account of a portion of them:

Relbunium hirtum (Schumacher), of the family Rubiaceæ, called by the natives "Cangai"; an herb used against acute rheumatism. Found in abundance.

Equisetum species, family Equisetaceæ, of which the native name is "Cola de Caballo"; a diuretic and astringent plant, used in cases of gonorrhœa and diarrhœa. Very scarce.

Petiveria alliacea, of the family Phytolaccaceæ, native name "Guinè o Pipi"; a plant of which the root is used as a febrifuge, and against rheumatism, hydrophobia, snake-bites, etc. Rather common.

Stachytarpha dichotoma, of the family Verbenaceæ, named by the natives "Yerbon o Menstruz"; a common plant, used as a tonic, and in bronchitis, coughs, convulsions, colic, paralysis, contusions, etc.

Peperomia species, of the genus Piperaceæ, the common name of which is "Yatebú-caá"; a febrifuge and a tonic. Found in abundance.

Scirpus capillaris, of the order Cyperaceæ, native name "Espartillo"; recommended for pulmonary affections. Found very frequently.

Calopogonium cæruleum, of the order Leguminosæ, by the natives called "Cumanda viray"; an abundant herb, employed as an aperient febrifuge.

Hyptis species, belonging to the order Labiata, known amongst the common people as "Ovechá-caá"; found rather frequently, and used in the treatment of syphilis.

Begonia cuculata, a member of the family Begoniaceæ, known amongst the inhabitants as "Agrial"; possessing antiscorbutic diuretic, and antiphlogistic properties, and employed against catarrhal affections, and against inflammation and irritation of the urinary passages. Often met with.

Tagetes glandulifera (Schrk.), of the order Synanthereæ, the native name of which is "Zuico" or "Chinchilla"; a scarce herb, with tonic qualities.

Cuphea species, belonging to the family Lythariæ, called in the country "Icipo-peré"; a common herb, used as a purgative, diuretic, and a purifier of the blood.

Rhynchosia diversifolia (Mich.), a member of the order Leguminosæ, the vulgar denomination of which is "Urizú-heé"; an expectorant, and a remedy for spasmodic coughs.

Cuscuta species, of the family Convolvulaceæ, by the natives named "Cabello de Angel," or "Icipo Chumbo"; a parasitical plant, with gently laxative, diuretic, and antiphlogistic properties, used in the form of an infusion for intermittent fevers, congestion of the respiratory organs, and in the shape of a tea in cases of hæmoptysis, inflammation of the throat, and internal abscesses. It is not very common.

Chenopodium anthelminticum, of the family Chenopodiaceæ, called by the natives "Yerba de Santa Maria," or "Caané"; an herb of which an infusion in the shape of a tea has digestive, slightly stimulating, and diaphoretic properties. It is also used as a remedy for hysterical fits, indigestion, catarrh of the stomach, dysentery, pleurisy, asthma, and especially for paralysis of the tongue.

Ocotea (Strychnodaphne) suaveolens, one of the Lauriæ, in the vernacular "Laurel blanco," or "Canela molle"; a tree of which the leaves are recommended for their diuretic and carminative properties, and are also used as an emmenagogue.

Acanthospermum xanthioides, a member of the tribe of Synanthereæ, vernacular name of which is "Aganabicho"; a common antisyphilitic herb, also prescribed for gonorrhœa. The root is an intense narcotic.

Baccharis articulata, of the family Synanthereæ, the common appellation of which is "Carqueja"; an herb found abundantly, and useful against indigestion, sterility, etc.

Crotolaria incana, belonging to the order "Leguminosæ," and called by the natives "Yerba de Toro"; a com-

mon tonic herb, makes an excellent tea, is very aromatic, much used for stomach-ache, and produces a rich perfume.

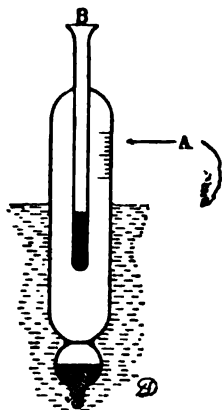
Senecio albicaulis, of the family Synanthérées, known in the country as "Yerba Mercurial"; an herb little met with, possessing qualities of a purifying, diaphoretic, antifebrile, and pectoral nature.

Discaria longispina (Miers), one of the species Rhamnaceæ, of which the native name is "Quina del Campo"; a scarce bush covered with spines, of which the roots have antifebrile properties.

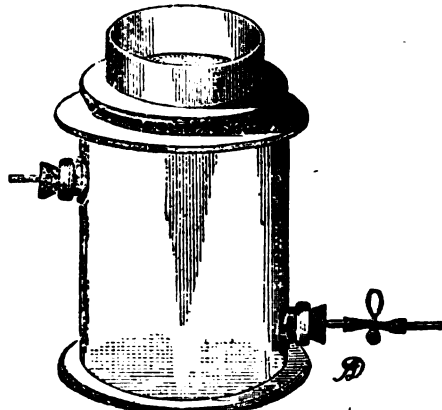
Anchieta salutaris, a plant of the family Violaceæ, called amongst the people "Cipo-zumo," and frequently found; has various purgative and antisyphilitic virtues.

Echites longiflora, of the genus Apocinæ, in the common tongue "Yalapa"; a plant used as a purgative, and in a powdered condition employed in plasters. Also made into an infusion.

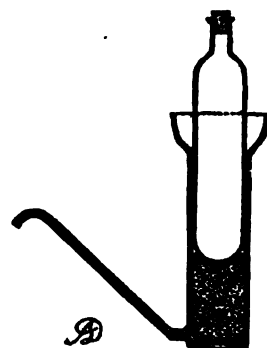
Julocroton Montevicensis (Klotz), classed among the Euphorbiaceæ, and called by the natives "Velamen"; is a somewhat rare herb, prescribed in cases of syphilis and syphilitic rheumatism.



Laska's Areometer.



Buechner's Filtering Apparatus.



Heerwagen's Mercury-Dropper.

ON A NEW AREOMETER.

It is well known that areometers cannot show the specific gravity of a liquid with great accuracy, owing to the capillarity of liquids, which renders it generally impossible to recognize the exact mark corresponding to the level of the liquid, which is usually concave. This defect has now been overcome by a device proposed by Dr. W. Laska, of Prague, which is as simple as it is ingenious.

The new areometer consists of an external body of the usual shape, into the upper part of which is fused an open tube, B. Upon the outside of the body of the areometer is engraved a scale in millimeters. When the specific gravity of a liquid is to be determined, the areometer is immersed, the liquid being at a definite temperature, and the millimeter mark corresponding to a fixed index, A, attached outside of the tube, exactly noted. Next an exactly weighed quantity of mercury is poured into the inner tube, and the new position of the areometer read off in the same way.

The calculation depends upon the value of one division of the millimeter scale as compared with the weight of mercury.

This is easily determined, once for all, by immersing the areometer in pure water at 15° C. (or at any other degree for which the instrument is to be used), and then ascertaining how many divisions it will be immersed by the addition of a known weight of mercury.

When the areometer is used for other liquids, the specific gravity is found by dividing the difference of immersion (before and after the addition of mercury) in millimeters with the weight of the mercury in milligrammes.

Before using the areometer for another operation, it must be rendered scrupulously clean.—*Zeitschr. f. Instrum.*, 1889, 176.

Synthesis of Active Coniine.

SCHORLEMMER, in his "Rise and Development of Organic Chemistry," has stated that the complete synthesis of active coniine has not yet been accomplished, but the author has previously shown that the alkaloid in question can be obtained from its elements.

Acetic acid can be prepared synthetically, and from it acetone, isopropyl alcohol, and glycerin can be successively obtained. Glycerin can be converted into bromallyl, and then into trimethylene bromide, and from the latter piperidine and finally pyridine can be produced. A picoline can be obtained from pyridine (Ladenburg and Lange, *Ann.*, 247, 5), and can be converted into coniine (Ladenburg, *Ann.*, 247, 80).

The dextro-tartaric acid which is necessary to the production of the active base can also be prepared from its elements.—A. LADENBURG in *Berichte*, 22, 1403 (and *J. Soc. Chem. Ind.*)

FLAT-BOTTOMED FILTERING APPARATUS.

THE form of filtering apparatus shown in the accompanying illustration and devised by Dr. Buechner is very serviceable, particularly for mixtures which ordinarily clog filtering paper in a short time. Moreover, the apparatus facilitates the rapid washing of any precipitate. The flat-bottomed glass dish on top, which has a sieve-like bottom, fits hermetically into the receptacle, which may be connected with the filter pump by means of the upper lateral connection.

APPARATUS FOR DELIVERING QUICKSILVER IN DROPS.

THE adjoining figure illustrates an apparatus suggested by F. Heerwagen for delivering mercury in drops, and requires but little description. The closed flask might be replaced by a small test tube, and the outer vessel by a test tube of larger calibre, to the bottom of which a small delivery tube of glass has been attached. The enlarged upper extremity of the outer vessel is calculated to avoid

any overflow of mercury caused by carelessness in applying force to the plunger, but is not an essential feature.—*Chem. Centralblatt.*

Eikonogen—A New Universal Developer for Photographic Dry Plates and Bromide Paper.

ADVANCES in photography are now so rapid that it is somewhat confusing to the professional or amateur photographer as to when and where the improvements will stop—if they ever do. Simply the subject of developers for dry plates would compose a volume if all the formulas, with their variations, were published, including, as it would, the experience and whims of hundreds of photographers. Scientists in chemistry have been experimenting upon the remarkable reducing power on the silver salts observed in the derivatives of aniline, and have endeavored to make them of practical use in photography.

Such a derivative was discovered early in this year by Dr. Anderson, of Berlin, Germany, and is named "eikonogen." It is manufactured there by very extensive aniline dye works, and promises to supplant all other developing agents yet proposed.

It is a substitute for pyrogallol, hydroquinone, oxalate of potash, and sulphate of iron, and, in fact, of all chemicals that reduce the silver salts. As it can be so easily made, it becomes at once the cheapest reducing chemical now on the market, and we have no doubt, as the demand increases, the price will still be lower. It is packed in small tin cans similar to those holding aniline dyes, having a hinged spout at one corner.

It will keep indefinitely in a dry powder in any climate, provided it is not injured by the fumes of ammonia, with which it must not come in contact. It is in the form of a greenish-white powder, which, when dissolved in water, turns to a dark green color, but is perfectly clear.

The advantages claimed for it, and which we have found to be substantially true by experiment, are that it produces a bluish-black colored image, depositing in the film a very delicate precipitate, which, in consequence, brings out the finest details to a degree that is surprising. The structure of the picture film is, therefore, much more compact and finer grained than it is possible to obtain with the pyro or ferrous oxalate developer. The developer operates regardless of the temperature. Hence it is adapted for use in hot or cold climates. It is non poisonous, perfectly harmless, does not stain the fingers, does not discolor or deteriorate when exposed to the air in a tray or graduate, always keeps clear, will keep mixed in a well-stoppered bottle ready for use for over a month, and acts so quickly and powerfully that the ordinary exposures given for pyro development may, it is said, be reduced one half. But its pre-eminent quality, in addition to its great reducing power, is that it does not stain the film in the least, even after repeated use, and hence a given quantity of solution

may be used over and over again until its developing power ceases.

The stainless nature of the developer adapts it admirably for the production of line work negatives on dry plates, for the development of lantern slides, and for positive prints on gelatino-bromide paper or porcelain. So satisfactory is the working on paper that we have substituted it for the ferrous oxalate developer. Its particular merit is that every copy on paper is beautifully clear in the high lights, which is a point of great importance in making bromide enlargements.

For shortly exposed plates and bromide paper the following formula for a one-solution developer works well:

Sulphite of Sodium c. p.....	2 oz.
Carbonate of Potassium	1 "
Distilled, Melted Ice, or Rain Water.....	80 "
Eikonogen.....	1 "

Dissolve in the order named. Eikonogen is perhaps ten times less soluble than pyro. We tried to dissolve the ounce in 10 and 20 ounces of distilled water, but without success. In using this developer, it is advised that from 6 to 8 drops of the following accelerating solution be added:

Hyposulphite of Sodium.....	60 gr.
Bromide of Sodium.....	860 "
Water.....	8 oz.

We simply added 3 or 4 grains of bromide of potassium to 5 ounces of the developer and obtained good results.

It is not necessary to mix the carbonate of potash to form one solution. It may be kept separate and dissolved in concentrated form in the proportion of 160 grains to the ounce of water. Taking 5 ounces of the sulphite and eikonogen solution, and adding thereto from $\frac{1}{4}$ to $\frac{1}{2}$ drachm of the potash solution as a developer, will bring out an ordinarily well-exposed plate as rapidly as if a strong pyro and potash solution were employed. After the image is well out and there are some details in the shadows that do not appear, it is only necessary to add a drachm of the potash solution to the developer to easily bring them out. There is no fogging of the film whatever by the developer. Hence, though the image may appear suddenly and be well developed within a minute after the developer is applied, one need not fear to leave it on long enough to acquire sufficient density. If the developer operates too fast, it may be improved by diluting with water and adding a few grains of bromide of potassium. Or the developer may be poured off and a weak bromide of potassium solution be poured on. A developer for lantern slides need not be as strong in eikonogen as for negatives. We recommend the following proportions:

Sulphite of Sodium c. p.....	10 gr.
Carbonate of Potassium.....	2 "
Eikonogen.....	5 "
Water (Distilled or Rain Water)	1 oz.

The above may be used as one solution, and will develop a number of lantern slides. As soon as it begins to work slow, 2 or 3 grains of carbonate of potash added will accelerate it. The high lights will be absolutely clear, while the black portions will not be too dense for the lantern. The tone is bluish black.

Eikonogen and Soda Developer.

A.

Sodium Sulphite (crystals, c. p.).....	4 oz.
Distilled Water.....	60 "
Eikonogen	2 "

B.

Sodium Carbonate (crystals).....	8 oz.
Distilled Water.....	20 "

Dissolve in order named. A developer is made by adding to 3 ounces of A, 1 ounce of B.

Single Solution, Eikonogen and Soda Developer.

Sodium Sulphite (crystals, c. p.).....	4 oz.
Sodium Carbonate.....	3 "
Distilled Water.....	80 "
Eikonogen	1 "

Dissolve in the order named. Add a few drops of the hypo-solution during development. All of the formulæ are based on 437 $\frac{1}{2}$ grains to the ounce.

The usual alun and fixing baths may be employed.

We notice that the developer permeates the film more evenly and rapidly than with pyro, and acts with an energy which is astonishing. For under-exposed or instantaneously exposed plates it is especially adapted, and will make the production of such pictures a pleasure.

We have developed in seven ounces of solution twelve 10 by 12 plates in succession without replenishing it. After four plates have been developed, the solution should be filtered to eliminate the floating particles of gelatin that become detached during development. The color becomes yellow when it is exhausted. It is probably unnecessary to rock the tray. We are glad to know that eikonogen is to be supplied to the trade here in large quantities. As a universal developer for dry plates, it stands at the head,—*Sci. Amer.*

Notes on Strophanthus.

At the recent British Pharm. Conference, Mr. Thomas Christy presented a paper on "Strophanthus Plants," in the course of which the author referred to the want of uniformity which exists in the strophanthus seeds as they come into commerce. Even seeds from the same source, when germinated, yield plants which are often different amongst themselves. After the paper was read fresh specimens of the plants grown in his greenhouse were shown, to illustrate this assertion, and amongst a dozen or so we did not observe two which could be said to be identical. But it would be useless to attempt to give here without engravings that part of Mr. Christy's paper in which he referred to the plants. It will suffice to give the report made to him by Professor Husemann, of Göttingen, on a comparative analysis between tinctures of the seeds known in commerce as "Kombé," "Hispidus," "Minor," and "Niger." Professor Husemann says:

Both seeds of *Strophanthus niger* belong to the series of cardiac drugs. "In their action upon the heart they are hardly to be distinguished from the African species of strophanthus, commonly known as 'Kombé.' I made experiments with the alcoholic extract after eliminating fatty matters with ether. The minor variety yielded 10 per cent, and hispidus about 12 $\frac{1}{2}$ per cent of extract. The latter, by reason of a large percentage of chlorophyll, is greener than the former, which is of a dark brown color. Of both extracts, 1 Cg. stopped the heart's action in a frog within a few minutes; no special direct action was noticeable upon the veins, showing in this respect that the two extracts above mentioned do not differ in any way from that obtained from the Kombé; and, furthermore, no 'narcotic' action was found."

Mr. Christy then proceeded to describe inquiries which had been made by Dr. Blondel under his direction, and which resulted in the discovery that what they had taken for *S. Kombé* was really only a variety of *S. hispidus*, or the mother species, as Mr. Christy pertinently called it. Another species of the plant, known as "glabrus of Gaboon," was next referred to. It is noteworthy, in connection with this specimen, that it is the same kind as Hardy, Gallois, and Polaillon used in their experiments, during which they discovered a crystallizable alkaloid.

We also understood from Mr. Christy's remarks that this is the seed which Continental chemists use in the manufacture of crystallized strophanthin. He showed one of the plants propagated from the seed. It has leaves somewhat similar to the Kombé species. Proceeding, he spoke of some suspicious seeds that he had met with, and concluded by saying that at the Paris Therapeutical Congress Dr. Dujardin-Beaumez clearly put forward as the result of his experiments with the tincture of strophanthus, that he obtained an entirely different action when he employed strophanthin, and he strongly advised medical men to keep to the tincture, as giving the best results.

At the same conference another paper, relating to the "Chemistry of Strophanthus," was presented by Dr. T. R. Fraser. This paper was of great length. The author first spoke of the seeds, and gave a proximate analysis of them, which was as follows:

	Per cent.
Water.....	6.7
Petroleum Ether Extract (chiefly fat).....	81.81
Ethyl Ether Extract (Resin, Chlorophyll, etc.)...	0.845
Alcohol Extract (20 sps. to 1 of seeds).....	8.94
Water Extract, Mucilage.....	7.85
Water Extract, Albumen.....	1.95
Ash.	8.514

	61.109
Undetermined	88.891
	100.000

A careful examination was made of the extracts obtained by means of the ethers, and after purification they were reduced to a pale greenish-yellow oil having a spec. grav. of 0.975; but this factor varied somewhat, a pale-green oil from other seeds being 0.954, and a dark greenish-brown one 0.9267. The alcohol extract was next described. It was found to consist of

	Per cent.
Impure Strophanthin.....	63.367
Mucilage.....	16.275
Resin	14.542
	94.184

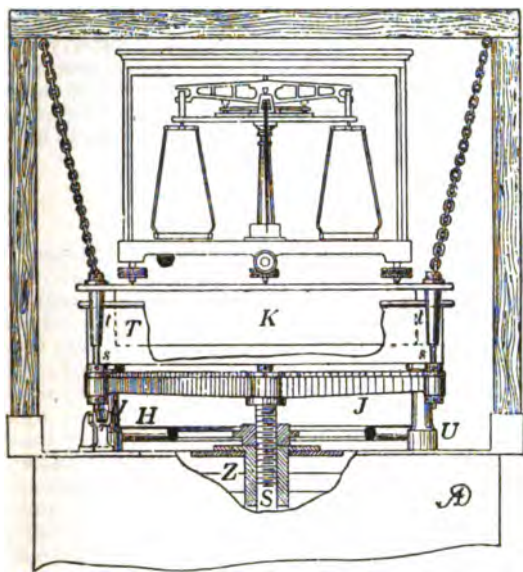
Following this an analysis of the separated testa and cotyledons of the seeds was given, and this showed that the testa yields most of the coloring matters, and the cotyledons and embryos most of the strophanthin and oil. Having described the reactions of the alcoholic extract, the author proceeded to show that it does not contain an alkaloid, but he conclusively demonstrated the presence of a glucoside—strophanthin—and gave the following as his method for the preparation of that body:

The active principle was precipitated by a solution of tannin from a strong solution of the alcoholic extract in water; the well-washed tannate was thoroughly mixed with recently precipitated, carefully washed, and moist oxide of lead, which was added in the quantity calculated

to be necessary for the conversion of the tannin into tannate of lead; the mixture was digested for several days at a low temperature, and after it had been dried it was thoroughly exhausted with rectified spirit and occasionally with proof spirit. If the alcoholic solution still contained any tannin, as it usually did, it was evaporated to a syrupy consistence, and again treated as above with a smaller quantity of oxide of lead. It was frequently necessary to adopt a third such treatment before every trace of tannin had been removed. The product was now dissolved in weak alcohol, and, if necessary, decanted and filtered from sediment; and through the clear and usually almost colorless solution a gentle stream of well-washed carbonic acid was passed for two or three days, in order to remove traces of lead. The solution was then evaporated to dryness and the residue dissolved in rectified spirit, and after filtration ether was added to the solution to precipitate the active principle. The precipitate was dissolved in absolute alcohol, which usually left a further slight sediment, and the clear alcoholic solution was finally dried by spontaneous evaporation and by being placed in a partial vacuum over sulphuric acid.

By this process about 65 per cent of the active principle, strophanthin, was usually obtained from the extract. This quantity, undoubtedly, does not represent the whole of the active principle present in the extract; but the result otherwise is satisfactory in so far as the quality of the product is concerned.

The strophanthin obtained is a colorless, opaque, and brittle substance, which is not crystalline to the naked eye, but is found to be so under the microscope. It is soluble in 55 parts of alcohol spec. grav. 0.796, and insoluble in ether and chloroform. An analysis of the pure body showed its composition to be represented by the formula $C_{10}H_{12}O_8$. It gives a bright green color with sulphuric acid, with 10 per cent nitric acid at 115° – 130° F. a bright violet color with blue streaks, and with other reagents colorations which are more or less indistinctive.—*After Chem. and Drugg.*



AVOIDING VIBRATION IN FINE BALANCES.

ONE of the most annoying features connected with the use of fine balances in buildings situated along lines of heavy traffic is the vibration when the arrest of beam and pans is released. This often makes it impossible to read off the index, and, moreover, gradually reduces the delicacy of the instrument.

To do away with this drawback, W. Marck, of the imperial bureau of weights and measures at Vienna, devised a new method, consisting partly in a suspension of the balance from above, and partly by floating the balance case in a tank of glycerin. The suspension is effected by four obliquely acting chains, the strain upon each of which is very small when the balance case floats, and is, moreover, as uniform as possible. When the balance is out of use, or in the intervals of the several weighings, during which the case must be opened, weights and load removed or altered—which could not well be done while the case is freely floating—the whole case is slightly raised by a horizontal wheel, H, acting upon the screw piston, S. As soon as the weights are rearranged and the scale is closed again, a turn of the wheel will cause the case to sink far enough to float again.

With this arrangement the author has completely neutralized the vibratory disturbance caused by passing wagons and the like.

He adds that this new method has also some disadvantages, viz., the greater care and time required in using the balance, and "the alteration in the composition of the air due to the vapors arising out of the glycerin bath."—*Zeitschr. f. Instrum.*, 1889, 175.

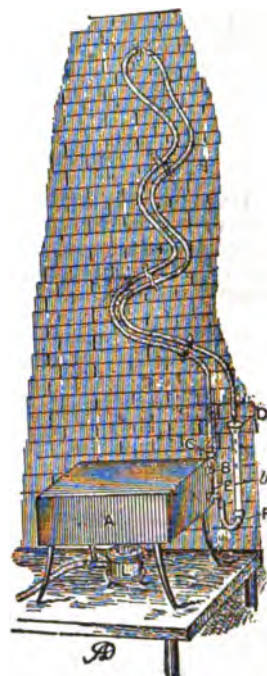
[Note by Ed. Am. Drugg.—We think the author is mistaken regarding those "vapors." Certainly no glycerin

is volatilized from such a bath. The only possible source of contamination which we can imagine is that the glycerin will naturally abstract more or less water from the air in the course of time, and that, when the surrounding air is comparatively dry, it will take up some aqueous vapor from the bath. It appears to us that it might have been preferable to select another liquid, though, if it is much lighter than glycerin, the immersed part of the balance case will have to be deeper. A fine grade of paraffin oil or liquid albolene may possibly answer.]

A CONSTANT WATER-BATH.

A DESCRIPTION of this apparatus will be found in the *Pharmaceutische Rundschau* for March, 1887, and in the Proceedings of the American Pharmaceutical Association for 1887. It has proven so satisfactory that I think it worth while to repeat the description here for the information of chemists. I have kept my bath boiling day and night seven days in the week, and have added water to it but five times in as many years.

It consists of the square box A, supported over a Fletcher's solid-flame burner. The top of the box, 15×15.5 inches, is formed by a brass plate $\frac{1}{4}$ inch thick, which thus is stiff enough to support a considerable weight without yielding, the sides and bottom being sheet copper. From the point B projects a $\frac{1}{4}$ -inch brass tube, B C, which turns up at a right angle. At E is a stop-cock, which is connected, by a thick rubber tube, with the glass tube D F, which is fastened against the adjoining wall. Connected with C by a rubber joint is a $\frac{1}{4}$ -inch block-tin tube of 20 feet length, which extends up the wall, in the manner shown, to the highest point, and thence returns and ends just over the slightly funnel-shaped top of the glass tube at D. The bath, being filled with water to just the level, B b, may be kept constant by boiling for many days without appreciable loss of water, the steam being condensed in its passage up, or—if uncondensed before it reaches the point—in its passage down the block-tin tube. In flat-bottom platinum or porcelain capsules, evaporation goes on very rapidly when placed on top of this water-bath. The whole surface of the bath is nickel-plated.—DR. BENNETT F. DAVENPORT, in *Journ. Anal. Chem.*, iii., 269.



The Nature of Solutions.

I BEG to announce that I have this day succeeded in isolating in the solid crystalline form one of the hydrates of sulphuric acid, the existence of which in solutions I had lately predicted from a study of the densities and heat of dissolution of sulphuric-acid solutions of different strengths. The new hydrate is $H_2SO_4 \cdot 4H_2O$, containing 57.66 per cent of acid. The proof of its existence depends on its having a definite melting point at -25° , which is lowered (as far as about -70°) by the addition of excess of either water or sulphuric acid, and on other evidence which it is not convenient to give in the present place. The isolation of one of the hydrates with either 2, 4, 5, or 9 H_2O had been rendered probable by a study of the freezing points of sulphuric-acid solutions, and the nature of the curves representing the freezing points of solutions from which the tetrahydrate crystallizes renders it highly improbable that any other hydrate will be obtained in the solid form, except, of course, the monohydrate, which has long been known. Such an absolute proof of the conclusions which I have drawn from other sources must place those conclusions beyond doubt, and must establish as an incontestable fact the existence of hydrates in solution.—S. U. PICKERING, in *Chem. News*.

Phenyl-Urethane.

THIS new compound, produced by the union of urethane and phenyl (C_6H_5), has been recommended by Giacomini, of Turin, as a new antipyretic, antirheumatic, and analgesic. It is administered in doses of about 8 grains. It is reported to be a most efficient agent in allaying the pain and reducing the swelling both in acute and in chronic articular rheumatism. As a general analgesic it has not always been as successful. The substance is in form of a white, crystalline powder, insoluble in water, but soluble in alcohol. It is best administered dissolved in wine.—*Rundschau* (Prag.).

Poisoning by Cotton Dyed with Lead Chromate.

DR. CARRY, of Lyon, reports on a series of poisoning cases among women engaged in winding yellow or orange yarns. All the symptoms indicated lead poisoning. Prof. Pouchet, of Lyon, however, found in three samples submitted to his examination no lead, and stated that the yarns were mordanted with a salt of antimony and dyed, No. 1 with Martins' yellow, No. 2 with Jaune solide, and No. 3 with "Jaune N. Poirrier." The writer obtained, at the request of Dr. Carry, specimens of the suspected yarns, and found, in concert with G. Schulz, of Berlin, that they were dyed with lead chromate, and not with the dyes above mentioned. Both the lead and the chrome were not merely qualitatively recognized but quantitatively determined. How Prof. Pouchet can have been deceived is questionable. The use of lead chromate is legal both in France and Germany. In an appendix, the author mentions that he found in a saddler's workshop in Berlin sewing thread dyed orange with lead chromate. It could scarcely be doubted that lead poisoning might ensue from the continued use of such thread.—*Chem. Zeit. and Sci. Am. Suppl.*

Hydroxylamine in Psoriasis.

HYDROXYLAMINE was first obtained by Lossen in 1865 from the reduction of nitrous acid; it is one of the bodies allied to ammonia, NH_3 , being ammonia and NH_4OH hydroxylamine, and, like ammonia, has the peculiarity of readily entering into combination with hydrochloric acid.

NH_4HCl = ammonium chloride.

$\text{NH}_4\text{OH.HCl}$ = hydroxylamine hydrochlorate.

The hydrochloric combination of hydroxylamine is characterized by its ready solubility in water, alcohol, and glycerin, and these combinations turn blue litmus paper an intense red.

It is a narcotic, and produces paralysis of the nerve centres, and in large doses produces convulsions and death. Experiments upon animals and upon blood outside of the body have shown that oxyhæmoglobin of the blood is transformed by hydroxylamine into methæmoglobin by abstraction of oxygen. This reduction property which it possesses is very energetic and rapid.

In treating psoriasis, the author employs either an alcoholic solution, such as:

R Hydroxylamin. Hydrochlor.....gr. 8 to 8
Alcohol.....fl. oz. 4
Calcii Carbon.....q. s. ad neutr.

D. S. Apply with brush,

or a watery solution, applied as in a hydropathic band:

R Hydroxylamin. Hydrochlor.....gr. 16
Aque.....fl. oz. 32
Calcii Carbon.....q. s. ad neutr.

D. S. Apply as wet cloth.

As in other applications, the scales are to be first removed by bathing, rubbing with green soap, and applications of 10 per cent zinc salve. As this new substance has decided toxic properties, the 1 to 1,000 or 1 to 500 neutralized solution is used in the beginning, and the stronger applications, up to one-half per cent, are gradually employed, being painted on the diseased areas twice daily. A cloth wet in the solution, or a Priessnitz band, can be applied every two hours to suitable parts. As is the case with pyrogallol, chrysarobin, and some other substances, albumin may appear in the urine as a consequence of absorption of the drug.—*After J. Cutan. and Gen.-U. Dis.*

Concentrated Infusion by Cold Percolation.

WHAT is required in a concentrated infusion is, first, that it should when diluted yield a product as near like the fresh infusion in taste, color, and smell as is possible; secondly, that it should not be liable to decompose or deposit on keeping.

Two things must be borne in mind during preparation: that the drug to be treated be in the most suitable state of subdivision to allow the free extraction of soluble matter; and that the menstruum employed be the best adapted for that purpose.

Concentrated infusion of calumba is one of the most unsatisfactory for keeping. If prepared as follows a satisfactory article will result: Take picked calumba root, 2 lbs.; reduce to a uniform, very coarse powder in a drug mill; macerate the powder in a mixture of 12 oz. of rectified spirit and 48 oz. of distilled water. After forty-eight hours percolate slowly until no supernatant liquid remains; then add distilled water in small, successive portions until 80 oz. are collected. If the calumba root be too finely powdered, a semi-fluid, gelatinous mass will result upon maceration, rendering percolation almost impossible.

Infusion of gentian is perhaps in more constant demand than any other. Take gentian root, bruised, 8 oz.; dried orange peel, bruised, 8 oz.; fresh lemon peel, 16 oz. Dry the lemon peel with a gentle heat and cut small; macerate together with 50 oz. of distilled water and 12 oz. of rectified spirit for twenty-four hours; pack in a percolator and continue percolation with distilled water until 68 oz. have passed through; reserve this and continue adding more water until the marc is exhausted. If more than 12 oz. are required to effect this, evaporate the second percolate down to 12 fl. oz., and when cold mix with the reserved portion. Stand aside for twelve hours to allow any deposit that may form from the mixture of two solutions to settle; and then, if necessary, filter.

The quantity of menstruum required to effect exhaustion is resultant upon three things: that the drug should be thoroughly permeated by the liquid during maceration; the manner in which it is packed into the percolator; and that care be used in pouring successive portions of liquid over the marc, so as to avoid causing too rapid percolation, and still not allow air bubbles by the liquid falling below the top of marc. This applies equally to percolation at all times.

Acid infusion of roses is a favorite vehicle with some prescribers. The following method of procedure will yield a preparation in all respects superior to a fresh infusion: Take 1 lb. dried red rose petals, and break small by rubbing through a coarse wire sieve; macerate the broken petals with 70 oz. of distilled water, shaking frequently. After four days transfer to a percolator and exhaust as follows: Collect 1 pint of liquid and with this repercolate; repeat this with the second and third pints which pass through; displace by adding water in successive portions until the percolate measures 80 oz.; add to this 3 v. m. 20 pure sulphuric acid, and shake well together.

Most readers will remember at one time or another having had to use a "concentrated infusion of senega," with an unsightly-looking deposit at the bottom of the bottle, representing sometimes one-third of the whole bulk. Such a state of things may be obviated by making your own preparation as follows: Take senega root 2 lbs., reduce to a coarse powder, and macerate for forty-eight hours in 64 oz. of distilled water. Then allow to slowly percolate, and with the first portion which passes through repercolate, finally adding more water until the collected percolate measures 64 oz.; to this add 16 oz. of rectified spirit. Set aside for three days, filter, and make up to 80 oz. with distilled water.—*Br. and Colonial Drug.*

Note on Oil of Cassia.

SEVERAL pages in the October report of Messrs. Schimmel & Co., of Leipzig, are devoted to the controversy that has arisen upon the statements made by Messrs. Schimmel respecting the adulteration of certain brands of cassia oil (*Pharm. Journ.*, April 20th, p. 842). It will be remembered that the samples of oil that had been certified by the proprietor of a "medical hall" in Hong Kong as being pure and completely volatile were reported by Messrs. Schimmel to contain an ingredient that they had identified as petroleum, and to leave, on redistillation, 25 per cent of a solid residue that had been recognized as pitch resin. It appears that this report has drawn from the person responsible for the certificates, a Mr. Niedhardt, an assertion that Messrs. Schimmel's chemists have mistaken for petroleum a light hydrocarbon that is a natural constituent of genuine cassia oil, and that the resin was a natural product of alteration in the oil, which occurs to the extent of 30 or 40 per cent, even in an oil only a year old. In respect to the first point, Messrs. Schimmel protest against it being supposed that their chemists, who are engaged every day in dealing with essential oils, would confound with petroleum a terpene. Moreover, they state that after purification the substance in question has a specific gravity of 0.795 at 20° C., being considerably lower than that of any known terpene; also that it boils between 160° and 265° C., and is indifferent toward sulphuric acid. As to solid residue, it is pertinently asked how an oil that contained so much resin, even if it were a natural constituent, could be certified as "perfectly volatile." But the prevailing scarcity of pure cassia oil has had the effect of bringing into the market some old stocks, and afforded Messrs. Schimmel an opportunity of examining samples from seventy cases said to have been warehoused in Amsterdam for from nine to seventy years. These, whether distilled in a retort over an open fire or rectified by steam, gave as a distillate a clear oil, and the *residuum*, which varied from 5.5 to 8 per cent, was in every case *liquid* and did not solidify. Cassia oil distilled in Messrs. Schimmel's establishment from cassia chips, when redistilled at the end of four months, yielded 5.4 per cent of *liquid residue*, and an oil of the same age from cassia buds gave 4.4 per cent of liquid residue. As the result of this experience, the opinion is expressed that a good merchantable cassia oil should answer to the following characters:

1. It should have at 15° C. a specific gravity of 1.050 to 1.070.

2. Upon distilling, about 90 per cent of pure cassia oil should pass over, and the residue, which may amount to

6 or 7 per cent, and in no case to more than 10 per cent, should not become solid and assume a resinous appearance on cooling, but should remain semi-liquid at least.

Experiment has shown that no practical value as a test attaches to the relative solubility of cassia oil in alcohol when it contains an admixture of resin and petroleum.

It is thought that the determination of the value of mercantile cassia oils on a scientific basis will have to depend upon the quantity of *cinnamic aldehyd* contained in them. The percentages of cinnamic aldehyd obtained by Schimmel & Co. were as follows:

a. Pure Oils.

1. Home distillation from cassia chips.....	88.9
2. Home distillation from cassia buds.....	80.4
3. Brand "Ayong," age 60 to 80 years.....	76.0
4. Brand "Ayong," age 24 years.....	73.9
5. Brand "Ayong," age 20 years.....	89.4
6. Brand "Hop Lee," very old.....	76.6
7. Brand "Tai Foong," very old.....	78.4

b. Adulterated Oils.

8. Brand "Yan Loong," 1st lot.....	58.0
9. Brand "Yan Loong," 2d lot.....	68.2
10. Brand "Cheong Loong," 1st lot.....	58.7
11. Brand "Cheong Loong," 2d lot.....	52.9
12. Brand "Cheong Loong," 3d lot.....	57.8
13. Brand "Luen Tai".....	47.1

The amount of cinnamic aldehyd in these oils was found by determining the percentage of non-aldehyds after separating the aldehyd by means of sodium bisulphite, but some skill is necessary to obtain exact results. The results show that the amount of cinnamic aldehyd is smaller in proportion to the increase in adulteration. Further investigation will be required, but at present it may be stated that a cassia oil that contains less than 70 per cent of cinnamic aldehyd may be considered adulterated, and that probably an oil containing less than 75 per cent should be looked upon with suspicion. For instance, a sample of oil, brand "Ayong," age 9 years, which yielded 79 per cent of cinnamic aldehyd, left a liquid residue from which 10 per cent of fixed oil was separated, so that before it was adulterated this oil would have shown nearly 90 per cent of aldehyd.

The principal non-aldehyd constituent of cassia oil has been ascertained by repeated fractionation to be the *acetic ether of cinnamyl*, $C_9H_9O_2$, the portion boiling between 135° and 145° C. (at 11 Mm. atmospheric pressure) consisting entirely of that ether. The cinnamic alcohol, obtained by saponification, crystallizes from ether in white solid crystals, boils at 137° C. (11 Mm. pressure), and has a "somewhat hyacinthine odor." The presence of the acetic ether of phenylpropyl is also probable. Terpenes of the constitution $C_{10}H_{16}$ are not present, but probably sesquiterpenes and polyterpenes are. Free cinnamic acid, formed by oxidation of cinnamic aldehyd in contact with air, was found both in old oils and those freshly distilled, but always in small proportion.—After *Pharm. Zeit.*

Trade Interests in Germany.

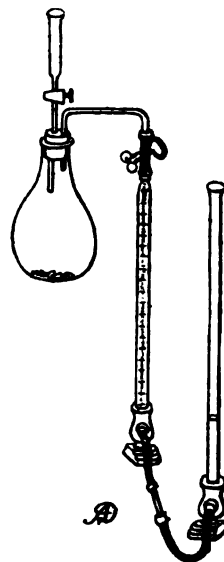
CONSUL-GENERAL MUELLER, in an exhaustive report on the "Commerce and Industries" of Germany, says in relation to the drug and chemical interests of the empire:

"The position held by Germany as one of, if not the leading drug, chemical, and dye producing countries was maintained during the year just closed. The Germans' determination to study, investigate, and experiment, never asking: 'Will it pay?' usually results in very profitable developments. The system of technical education is such as to aid men pursuing special branches. A large part of the world's rich trade in drugs is conducted or controlled by Germans. Of course, competition, both here and abroad, has reduced the profits on staple products to fair if not small margins; but firms holding letters patent or exclusive rights to the manufacture of specialties still reap large harvests of gain. Such profits are a constant stimulant to inventive endeavor, and have thus far resulted in an experimental activity whose gains have been enormous. Establishments in or near this city have assumed proportions more than colossal. One firm, namely, the Baden Aniline Company, requires more water and gas for its immense works than a city of 65,000 inhabitants; its stock is reported far above par, and its dividends are said to be simply enormous. The schools and universities enjoy a very high reputation in the matter of technical training in chemistry—a branch of the sciences upon which the drug, chemical, and dye trade is almost wholly dependent. Many young Americans are said to be here studying; hence the hope that the United States will soon have laboratories of its own, turning out men and work fully equal, if not superior, to those turned out and the work done here. There was an increase of \$522,865 worth of drugs, dyes, etc., exported to the United States over 1887 from this district, viz., in 1887, \$3,899,846.51; 1888, \$4,422,711.55."

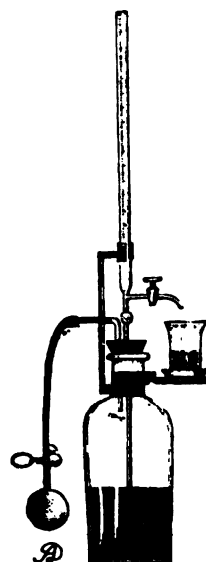
An Ideal Pomatum.—An Irish authority says that he is assured that a pomatum made as follows is an ideal one: Lanolin, 4 oz.; prepared lard, 1 oz.; rose water, 1 oz.; attar of roses, 10 drops.

APPARATUS FOR THE VOLUMETRIC ESTIMATION OF CARBONIC ACID.

A LITTLE flask of the capacity of 100 C.c., bearing in its stopper a thistle funnel with stop-cock, is connected, by means of a capillary tube, with a burette, which latter is again connected with a plain tube. About 0.1 to 0.2 Gm. of the carbonate to be examined—at all events less than would give off enough gas to occupy the full graduation of the burette—is placed in the flask. The stopper is then inserted, the stop-cock of the dry thistle funnel being open. Into the plain tube is now poured a sufficient quantity of saturated solution of chloride of sodium, so that the liquid in both tubes stands at exactly the same level, while at the same time the level of the liquid in the burette stands exactly at 0 (zero). All parts are, of course, suitably fixed in this position. The stop-cock of the thistle funnel is now closed and a little strong hydrochloric acid poured into it. Next, the plain tube is lowered so as to create a difference of levels, and the stop-cock of the funnel cautiously opened so as to deliver not more than one drop of the acid at one time. When the resulting effervescence has completely ceased, another drop is added, and this is continued until at the final addition of one or two drops no more gas is evolved. The liquid in the burette will, of course, be proportionately displaced by the gas, and the latter may be read off by volume, after the plain tube has been raised so as to bring the liquid in both tubes to the same level.—*Chem. Centralbl.*



Apparatus for Estimating Carbonic Acid.



Knoefer's Apparatus for Titration.

APPARATUS FOR TITRATION.

A USEFUL combination of burette and reservoir for the volumetric liquid is that devised by Dr. Knoefer (*Chem. Zeit.*, 1889, No. 55). As will be seen from the cut, the reservoir is a wide-mouth bottle, to the neck of which are fastened two holders, one for the burette and the other for the beaker containing the liquid to be assayed. The volumetric liquid is made to ascend into the burette by compressing the inclosed air by means of the rubber bulb. As the test liquid does not come in contact with any rubber, the apparatus may be employed for permanganate, nitrate of silver, etc. For caustic alkalies it is less suitable, unless the stop-cock is carefully paraffined.

Preparation of Sulphonal.

ACCORDING to the specifications of the patent granted by the German government, the following are the details of the process of making the new and popular chemical, sulphonal: 53 pounds of sodium ethylthiosulphate (produced by reacting upon sodium thiosulphate with ethyl chloride or bromide) are treated with 10 pounds of acetone and about 100 pounds of alcoholic hydrochloric acid. After several hours' quiescence or gently warming, about 70 per cent of the theoretical yield of mercaptol will have been formed. To this alcoholic solution water is added until all the mercaptol will have been thrown out of solution in the form of an oil, which latter is then oxidized to sulphonal by means of potassium permanganate. The rationale of the process is that the sodium ethylthiosulphate is split up in the presence of hydrochloric acid with the assumption of the elements of water, forming acid sodium sulphate and ethyl mercaptan. The resulting mercaptan is not separated, however, but is condensed at the moment of formation, in the presence of the acid, to mercaptol, which is less volatile and possesses a less abominable odor than mercaptan.

Bitters.

BITTERS may be roughly defined as "a compound prepared by steeping vegetable bitters, and some aromatics as flavoring, in weak spirits for eight or ten days; a little sugar or syrup being subsequently added to the strained or decanted tincture."

The vegetable bitters most in use are calumba, cinchona, cascarilla, chiretta, chamomiles, gentian, hops, orange peel, quassia, and wormwood; the latter five taking precedence, probably because of their ready manipulation and low cost. Many other bitters have been used, such as buckbean, 2 ounces of which are said to yield as much bitter as 1 pound of hops. The common box is much used in Parisian beer, according to a communication by Du Petit Thouars to the Philomathic Society. In some parts of France, as well as in Germany, the top of the common broom is employed; and this, as well as heath, has been used since time immemorial in Norway, Sweden, and Northern Scotland. In England mugwort has been used; and it is known that the foreign bitter, quassia, and likewise gentian, are much used in porter brewing. Gentian contains a saccharine principle which causes it to ferment rapidly and spoil. Calamus aromaticus yields a spicy bitter which entitles it to be used instead of hops, and it has been, and is now, largely collected for brewers [?] and manufacturers of bitters.

Amongst the objectionable bitters are nux vomica, bitter bean, cocculus indicus, and some others which it is not necessary to mention, as no reference will be made to them in the stock of recipes that are to follow.

It must now be supposed that we are addressing those who are about to establish a bitter, and so our recipes will be as practical as possible. Some modifications according to taste and fancy may be made if desired in any or all of them; but in the combinations that we offer them they are acknowledged to be as near perfection as possible. As to names, those we leave entirely to the ingenuity of the manufacturer, who will doubtless find a suitable cognomen for the bitter, guided in his selection by either the names or qualities of some of its constituents; or, possibly, he may surround the manufacture with a pleasant halo of classical fiction, and find a name for it amongst the gods and goddesses, or he may subsidize botany for a floral name, or the poets for one of fancy. In either case the name should be short, sharp, and decisive, not easy to imitate, and one that will catch the eye and arrest the inquiring attention of the public, and admit of an effective illustration.

Some of the following recipes are very good and very elaborate, too much so, in point of fact, for anything like practical commercial manufacture; but they are capable of supplying suggestions, therefore do we add them to our list.

To start with, then, let us take the recipe from which the celebrated Angostura bitters are made, and this by its effusiveness will lead you to question the possibility of its being a paying commodity; but it is, in spite of the circumstance that only a very small quantity is used at a time.

1. Take 4 ounces of gentian root, and slice up very thin; 10 ounces each of calisaya bark, Canada snake-root, Virginia snake-root, licorice root, yellow bark, allspice, dandelion root, and Angostura bark. All these must be broken, bruised, or cut up small. Angostura is imported from South America, and is a very valuable bitter, being both aromatic and pungent. Six ounces of cardamom seeds; 4 ounces each of balsam of tolu, rhubarb, and galanga; 1 pound of orange peel; 1 pound of alkanet root; $1\frac{1}{2}$ ounces caraway seed; $1\frac{1}{2}$ ounces of cinnamon; $1\frac{1}{2}$ ounces of cloves; 2 ounces of nutmeg, coriander seed, catechu, and wormwood; 1 ounce of mace; $1\frac{1}{2}$ pounds of red sanders, and 8 ounces of turmeric. Pound all separately and mix together, steeping for fifteen days in 50 gallons of proof spirit. Before filtering, add 30 pounds of honey.

2. Another very elaborate bitter is the following, which, however, has a wonderful flavor and American origin: Take of plain proof spirit 90 gallons; of red cinchona bark, $3\frac{1}{2}$ pounds; calisaya bark, $3\frac{1}{2}$ pounds; calamus root, $1\frac{1}{2}$ pounds; orange peel, $4\frac{1}{2}$ pounds; cinnamon, $3\frac{1}{2}$ ounces; cloves, $3\frac{1}{2}$ ounces; nutmeg, $3\frac{1}{2}$ ounces; cassia buds, 2 ounces; red sanders, $6\frac{1}{2}$ pounds. First mash all the ingredients, put them in the spirit, and let them infuse for fourteen days, stirring the mixture well twice every day. Rack off and color with 11 pints of brandy coloring, to get a dark red tint. Stir a quarter of an hour. Dissolve 30 pounds of white sugar in 30 gallons of water, add, and again stir for half an hour. Let the mixture rest for four or five days, and when bright, bottle. If the sanders is not used, the color will be a bright amber. Compounded according to the above directions, this will yield about 120 gallons at 25° below proof.

3. This next combination yields a very nice bitter, but you might have some difficulty in getting a supply of dried orange berries.

Macerate $2\frac{1}{2}$ pounds ground dried small orange berries, $\frac{1}{2}$ pound ground dried orange peel, 2 ounces ground dried calamus root, 2 ounces ground dried pimpinella root, 1 ounce ground or cut hops, for fourteen days, with 10 gallons of spirit at 45 per cent; press, and add $2\frac{1}{2}$ pints of

brown sugar syrup. Filter. The color should be dark brown.

4. A splendid French bitter is made from $1\frac{1}{2}$ pounds each red cinchona bark, calisaya bark, bitter orange peel, and sweet orange peel; 2 ounces of calamus root, 4 ounces of cardamom seeds, $1\frac{1}{2}$ ounces each cinnamon, cloves, and nutmeg; 4 ounces of caraway seeds, and 3 pounds of wild cherry bark. Pound all these ingredients to a coarse powder and steep for fifteen days in 45 gallons of proof spirit, or 60 gallons of spirit 25° below proof, stirring occasionally. Then rack it off, and mix sufficient caramel (burnt sugar) to make it a dark red; add 15 pounds of white sugar dissolved in 15 gallons of water. Let the whole settle, then filter.

This bitter can be made of a handsome amber color by omitting the wild cherry bark and caramel coloring.

5. In Hamburg there is a firm manufacturing a bitter from the following recipe, which has a big demand. Grind to a coarse powder 2 ounces of agaric, 5 ounces of cinnamon, 4 ounces of cassia buds, $\frac{1}{2}$ ounce of grains of paradise, 3 ounces of quassia wood, $\frac{1}{2}$ ounce of cardamom seeds, 3 ounces of gentian root, 3 ounces of orange berries dried, $1\frac{1}{2}$ ounces of orange peel. Macerate with $4\frac{1}{2}$ gallons of 95 per cent alcohol, mixed with $5\frac{1}{2}$ gallons of water; add $2\frac{1}{2}$ ounces of acetic ether. Color the liquid brown.

6. The Spanish people revel in a bitter made from the following ingredients: Grind to coarse powder 5 ounces of polypody, 6 ounces of calamus root, 8 ounces of orris root, $2\frac{1}{2}$ ounces of coriander seed, 1 ounce of centaury, 3 ounces of orange peel, 2 ounces of German chamomile flowers; then macerate with $4\frac{1}{2}$ gallons of 95 per cent alcohol, and add $5\frac{1}{2}$ gallons of water and 1 ounce of sugar. Filter, and color brown.

Quite a number of recipes have been manufactured from the foregoing and varieties made of them, and some may feel disposed to work out one or two for themselves; but it is our idea that something of a much simpler character, if well concocted and carefully put together, might be made from the following recipes or their variations.

7. Grind to coarse powder 4 ounces of cinchona or of chiretta bark, 10 ounces of sweet orange peel, 1 ounce of lemon peel, 1 ounce of bitter orange peel, 1 drachm of cinnamon, 1 drachm of nutmeg, 1 drachm of cloves, and 30 cayenne seeds. Infuse for about ten days in 4 gallons of 65 per cent alcohol, and then filter off into bottles.

8. Several recipes are given for making orange bitters, from which we have selected the two following:

(a) Macerate 6 pounds of orange peel for twenty-four hours with 1 gallon of water, and then cut the yellow peel from off the white; or you may purchase the peel cut very thin in the first instance, chop it fine, or run it through a coarse mincer, and then macerate with $4\frac{1}{2}$ gallons of 95 per cent alcohol for two weeks, adding afterwards a syrup made of 16 pounds of sugar dissolved in $4\frac{1}{2}$ gallons of water. Filter through flannel.

(b) This is much stronger: Take of Seville orange peel 1 pound; of lemon peel, $\frac{1}{2}$ pound; of gentian root, $\frac{1}{2}$ pound; of ginger, $\frac{1}{2}$ pound. Let them be bruised separately and set in an open cask or large crock, and 3 gallons of water poured over. Leave to macerate for three or four days, and then add 1 gallon of syrup and 1 quart of spirits of wine. Filter off and press the marc. The addition of a teaspoonful each of broken cinnamon and cloves adds much to the stomachic qualities and taste of the bitters. Twice the quantity of quassia may be used instead of the gentian, or half of each in proportion.

9. Bitters containing Peruvian bark are very much liked, so we give the following: Take of red Peruvian bark 8 ounces; orange peel, 8 ounces; $1\frac{1}{2}$ drachms each of cinnamon, cloves, and nutmeg; and 75 cayenne pepper seeds. Infuse them, well bruised, in 8 gallons of proof spirit for fifteen to twenty days, stirring every day. Draw off and filter.

10. One more recipe, and we have done with them. For a good stomachic bitter we can strongly recommend the following: Grind to a coarse powder $\frac{1}{2}$ pound of cardamom seeds, $\frac{1}{2}$ pound of nutmeg, $\frac{1}{2}$ pound of grains of paradise, $\frac{1}{2}$ pound of cinnamon, $\frac{1}{2}$ pound of cloves, $\frac{1}{2}$ pound of ginger, $\frac{1}{2}$ pound of orange peel, $\frac{1}{2}$ pound of lemon peel, $\frac{1}{2}$ pound of gentian root; and macerate them in $4\frac{1}{2}$ gallons of 95 per cent alcohol, and add before filtering a syrup made with $4\frac{1}{2}$ gallons of water and 12 pounds of sugar. . .

With such an assortment of recipes no difficulty should be experienced in compounding a special high-class bitter that would be worthy of a special name and pay for attention; and we may further remind the enterprising reader that vanilla may be added sometimes in small quantities, and that bitters made from coffee or tea have not yet been placed on the market. Either of these can be worked in with other simple bitters, and a very taking quality superadded, even though the virtue might be a matter of question. Certainly the public do lean towards tea and coffee in whatever form they may be produced, as they did for a time towards coca.—*Mineral Water Trade Review*.

Radam's Microbe Killer is said by the *Western Druggist* to be composed of 4 drachms of oil of vitriol, 1 drachm of muriatic acid, 1 ounce of red wine, and a gallon of water.

Formulæ for the Use of Creolin.

DURING the last few years none of the more recent remedies has had such a rapid success as creolin, identical with a patent fluid of which a refined preparation has been named "Liquor Antisepticus." When creolin was suddenly recommended in Germany as an unsurpassed non-poisonous disinfectant, many voices were heard which objected to the use of a remedy that was a "patent article"; but the hesitation was soon overcome when it was found that the preparation really fully deserved the claims made for it. In many hospitals, clinics, and in private practice, creolin has completely superseded the use of corrosive sublimate, carbolic acid, iodoform, etc., in antiseptic surgery. Authorities like Von Nussbaum, Von Esmarch, Professor Fröhner, Dr. Kortum, have given such favorable verdicts on creolin that it has now become a generally used disinfectant—for instance, for sterilizing instruments before operation, for irrigation of wounds after operation. Creolin is especially convenient for the disinfection of the hands. In ophthalmic, aural, and gynecological practice its use has become general. For prevention of the formation of pus, and for deodorizing large carcinomata, profusely discharging ulcers, creolin has proved very successful. [We copy the preceding statements with the reservation that we know of equally high authorities who deny the exorbitant claims made in favor of creolin.—ED. AM. DRUGG.] The following are the daily formulæ in Germany:

Solutio Creolini (half per cent).

℞ Creolini ℥ x.
Aque dest. 3 iv.

Sig. To be shaken for use. For the irrigation of wounds, impregnation of tampons, moistening of bandages, etc. Also for washing the genitals, and for syringing the uterus and vagina after delivery.

Solutio Creolini (two per cent).

℞ Creolini 3 i.
Aque dest. 3 vi.

Sig. To be well shaken before use. For the preparation of poultices and all dressings, for sloughing wounds, and for the disinfection of hands and instruments; also as a hæmostatic.

Injectio Creolini.

℞ Creolini ℥ ij. to x.
Aque dest. ad 3 iv.

Sig. The injections. As an injection for gonorrhœa, leucorrhœa, and catarrh of the bladder.

Pulv. Creolini.

℞ Creolini ℥ xxv. to 3 i.
Acid. borac. 3 ij.

Sig. Antiseptic powder. For dry bandaging; for eczema in the neck or nose.

Oleum Creolini.

℞ Creolini ℥ xv.
Olei olivæ 3 ij.

M. Sig. Antiseptic oil. For inunction of the hands in gynecological practice.

Pilula Creolini.

℞ Creolini ℥ xvij.
Extract. et pulv. glycyrrh. 5ā q. s.

Make 100 pills. Coat with collodion. Sig. Two pills to be taken night and morning.

Ungt. Creolini.

℞ Creolini ℥ xij
Lanolini. 3 ss.

M. F. ungt.

—After Provincial Med. Jour.

Synthetic Carbolic Acid.

THE "Badische Anilin- und Soda-Fabrik" at Ludwigs-hafen on the Rhine announces that it has put on the market absolutely pure phenol, or carbolic acid, prepared by synthesis. Hitherto all carbolic acid used in medicine or the arts has been prepared from coal-tar. But such an acid is never quite pure, always containing certain impurities derived from the coal-tar. The best proof of the presence of the latter is the melting point. Pure carbolic acid melts at 41°–42° C. (106°–107° F.). The commercial "pure" acid melts at 35°–37° C. (95°–98.6° F.), and among the very best brands existing in the market none were found melting above 39.5° C. (103° F.).

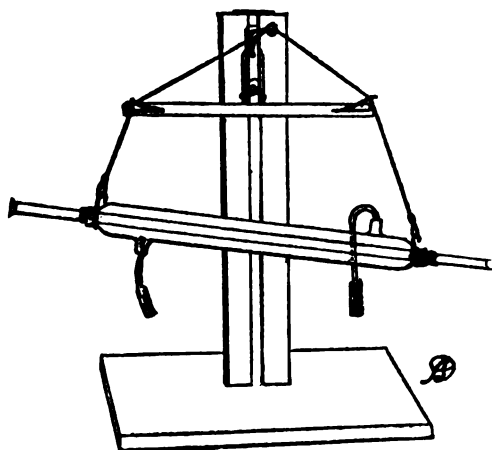
The melting point of the new synthetically prepared acid is, as stated above, at 41°–42° C. It boils at 178° C. (352.4° F.), the exact temperature heretofore found for pure phenol. This temperature rises to 181° C. when the whole thermometer is surrounded by the vapors of the boiling acid. The synthetic acid is absolutely anhydrous and colorless, and is soluble in 12 parts of water to an absolutely clear liquid. The most characteristic difference

between it and the acid prepared from coal-tar is the odor. All brands of the acid heretofore found in commerce possessed a more or less distinct tarry odor. The synthetic acid, however, has a faint "pure" odor, not in the least recalling that of coal-tar. The odor is almost unperceivable in a 5 per cent aqueous solution, which is not the case with the commercial sorts.

This synthetic acid is put on the market in two forms, in a coherent crystalline mass and in loose crystals.

Gehe & Co., in their October report, state that the precise method by which the acid is prepared has not become known, but that it is probably produced during the process of sulphonizing benzol and subsequent fusion of the benzol-sulphonate with caustic alkali.

The price of this synthetic acid is quite reasonable. It is quoted by Gehe & Co. at 4.60 marks per kilo, while the pure redistilled coal-tar carbolic acid is quoted at 4.10 marks. These figures will at least show the relative value of the two products at Dresden.



AN IMPROVED CONDENSER STAND.

AT a recent meeting of the Chemical Society, held at London, Mr. A. H. Allen described the following improved form of condenser stand, devised by Mr. W. Chat-taway and himself, which allowed the condenser to be reversed at any moment without disconnecting the distilling flask, while it permitted of the contents of the latter being agitated whenever desired. This was done by hanging the condenser from a stout leather thong, which passed over three small brackets attached to a piece of wood working vertically in a slot in the stand. The thong could be fixed by means of a screw at the end of the centre bracket. In practice the arrangement had proved very efficient and convenient.—*J. Soc. Chem. Ind.*



DESSAR'S NASAL DOUCHE.

THE Thudichum nasal douche, heretofore in quite common use, has been the cause in numerous instances of intense inflammation of the middle chamber of the ear and loss of hearing. A substitute for this apparatus, suggested by Dr. L. Dessar, is shown in the adjoining cut. It is impossible, in its use, to have any excess of force, and this objection to the Thudichum douche is therefore avoided. It consists of a glass vessel holding about 2½ ounces. The solution, warmed to a proper temperature, is placed in the cup, and the nozzle being inserted firmly into one nostril, the head is tilted backward and the cup raised. When the fluid is felt in the throat, the head is tipped forward and the mouth opened, whereupon the liquid will flow from the nostrils. Meyrowitz Bros., of New York, are the makers.

Green Mountain Salve.—Resin, 5 pounds; burgundy pitch, beeswax, and mutton tallow, of each ½ pound; oil of hemlock, balsam of fir, oil of origanum, oil of red cedar, and Venice turpentine, of each 1 ounce; oil of wormwood, ½ ounce; verdigris, very finely pulverized, 1 ounce. Melt the first three articles together and add the oils, having rubbed the verdigris up with a little of the oils and put in with the other articles, stirring well; then pour into cold water and work as wax until cool enough to roll.—*Formulary.*

The Arrow-root Plant.

MR. WILLIAM T. BRIGHAM, in his interesting work on Guatemala,* thus describes the preparation of cassava bread from the roots of the "arrow-root" plant:

In our walks about the town we were often politely invited into the houses, and so had a chance to see the cassava-bread making. The tuberous roots of the manioc (*Manihot utilisima*) often attain a weight of twenty or thirty pounds, and are full of a poisonous juice, deadly when swallowed. A mahogany board is provided, into which broken crystals of quartz are inserted, and this serves to grate the root into a coarse meal, which is washed carefully (the starch is partly removed, and settles in the water as tapioca), and is then placed in a long sack of basket-work, called very appropriately *serpiente*. This ingenious press is fastened at one end to a house beam, while on a lever placed through the loop at the other end all the children of the family sit in turn, or together if they are small; and the squeezed mass is dexterously made afterwards into flat loaves, about three feet in diameter, and not more than a quarter of an inch thick, dried, and then baked. The result is a wholesome and very nutritious bread, which keeps a long time and is capital on an excursion. Later on, when our own house-keeping was in order, we found it made excellent puddings, and was better than crackers in soup; while in the woods it was indispensable. It is also a capital diet in dyspepsia, can be eaten in sea-sickness when all other food is rejected, and serves to fill out the bony outlines of an emaciated human frame better than anything else. The clean white loaves can be easily exported, and are very attractive.

Sarsaparilla in Guatemala.

MR. WILLIAM T. BRIGHAM, in his work on "Guatemala,"* thus refers to the species of sarsaparilla he met with in that country:

One of the most troublesome vejucos, or vines, common all through the forests of the Atlantic seaboard, is the zarza, or sarsaparilla. Probably the American public is familiar with the popular remedies compounded in part with this valuable medicinal plant, which, belonging to the Smilax family, affects damp, warm forests, climbing to great heights over the trees. The portion used is the long, tough root; this the zarza gatherer digs and pulls from the loose soil, replanting the stem, which in due time replaces its stolen roots, to be again robbed. The roots are washed, loosely bundled, and sold to the dealers, who have the fibres made up into tight rolls, a few hundred of which are then pressed together and sewed up in the thickest hide that can be found; for the "custom of trade" includes the wrapper in the tare of the more costly drug. Most of the sarsaparilla exported from Belize comes from Guatemala and Honduras; but from Livingston more than 60,000 pounds were exported in 1884, of an appraised value of ten cents per pound. The plant is easily propagated by cuttings or seeds, and, of course, needs no cultivation or cleaning; the yield will average 20 pounds of dried root from each plant.

Plants with Dulcifying Properties.

AT a recent meeting of the Linnean Society, a specimen of the fruit of *Sideroxylon dulcificum*, the so-called "miraculous berry" of West Africa, was exhibited by Mr. D. Morris, the assistant director of Kew Gardens. He stated that the sweet pulp of the fruit, which is about the size of an olive, imparts to the palate a sensation which renders it possible to partake of sour substances, such as tartaric acid, lime juice, and vinegar, and gives them a flavor of absolute sweetness. The fruit of another plant, *Thaumatococcus Danielli*, possessing similar properties, was also shown, living plants of both having been recently received at Kew from Lagos from Governor Moloney. The *Sideroxylon* is mentioned by Dalzell in his history of Dahomey, where it is stated to be used by the natives to render palatable a gruel made from bread after it has become too stale for any other purpose. Unfortunately the peculiar sweetening principle is soon dissipated if the fruit remains ripe for any length of time. Preservation in spirit, acetic acid, or syrup does not appear to favor the retention of the dulcifying principle, according to Dr. Daniell, since he found that specimens of the fruit brought to England became insipid and lost their properties. In the case of *Thaumatococcus Danielli*, however, the properties of the mucilage surrounding the seeds appear to be retained much longer when the fruits are preserved in syrup. It would be interesting to ascertain the nature of the sweet substance contained in the fruits, and it may be hoped that the Kew authorities will not let so interesting a question fall to the ground without some attempts being made in various ways, such as obtaining the dried unripe fruits, to extract the dulcifying principle of these fruits.—*Sci. Amer.*

Uranium.

EXACTLY a century ago—namely, in 1789—Klaproth isolated from a dark-colored mineral, known as pitchblende, a yellow oxide which, after carefully testing, he pronounced to be the oxide of a new metal. To this metallic substance he gave the name of uranium, so calling it after the planet Uranus, then recently discovered by Herschel, and it was at once classed among the rare metals, and still remains so. Its rarity is indicated by its market price, which is about £2,400 per ton. The oxides and salts of this rare metal are chiefly used for making greenish-yellow tinted glass, in producing the costly black porcelain, and as a substitute for chloride of gold in photography. Ores containing the metal are found in Cornwall, Saxony, and Bohemia, but up to the present time it has only been met with in isolated pockets and patches. The centenary of its discovery by Klaproth has, however, been marked by the finding of a continuous lode at the Union Mine, Gram-pound Road, Cornwall, which is believed to be the only known lode in the world. This discovery is regarded as unique in the history of the metal, for the lode is what is known as a true fissure vein, and the ore is found to contain an average of 12 per cent of the pure metal, the assays going up as high as 30 per cent in some parts of the lode. Several tons of the ore have already been raised and sold, fetching high prices. It is anticipated that the present discovery will enable two important applications of the metal to be followed up. The first is as a substitute for gold in electroplated ware, inasmuch as with platinum and copper it forms two beautiful alloys, each having the appearance of gold, and the former also resisting the action of acids. The second application is in connection with electric installations, where its usefulness consists in its high electrical resistance.—*Chem. and Drugg.*

Insect-flower Growing in California.

The insect-flower plant (*Pyrethrum cinerariaefolium*) is now being grown on a large scale in California, and the powdered flowers are sold in that State under the name of buhach. The plant was first introduced into California about twelve years ago by a Mr. Mileo, a native of Dalmatia, who succeeded, after some trouble, in growing the plant on an extensive scale, and in 1880, associating himself with other capitalists, established the Buhach Producing and Manufacturing Company. At the present time the company have about 300 acres of this plant under cultivation at their farm near Atwater, Merced Co., California, and own mills for grinding the dried flowers to powder at Stockton, near San Francisco. The cultivation of the *Pyrethrum* requires careful and intelligent supervision, and it cannot be grown successfully without irrigation. It requires three years from the time of sowing to grow plants capable of producing a paying crop of flowers, and then they will bear from four to five years longer. It is at its prime, however, in its fourth or fifth year. The plant grows about 30 inches high, and is set out in rows 4 feet apart, and from 15 to 24 inches apart in the rows. The flowers are harvested towards the latter part of May. The stalks are cut just above the roots, and the flowers stripped from them by passing the plants through a kind of comb. The detached flowers fall into a box below, and are carried to the drying-ground, where they are spread on sheets and exposed to the rays of the sun during the day, being repeatedly turned over in the meanwhile. They are covered during the night to prevent their absorbing moisture, as the perfect drying of the flowers is most important in order to retain the volatile oil which gives the powder its insecticide properties. It is also very necessary that this operation should be done quickly, and that the flowers during the drying process should be protected from moisture. A slight dew falling upon the flowers at this time will injure their color and reduce their strength as an insect destroyer. In this respect, the California-grown flowers are said to be better cured, and consequently more valuable, than those produced in Dalmatia, the peculiar conditions of soil and climate in California being extremely favorable to the growth and curing of plants rich in the essential oil which renders them so destructive to insect life.

New Method of Making Acetate of Lead.

MR. H. LÖWE has recently obtained a German patent for making acetate of lead as follows:

The lead in the form of thin plates is exposed to the attacking influence of acetic acid containing 40 per cent of nitric acid added to it. The decomposition is effected rapidly and with a slight evolution of heat; the vapors which rise from the vat in which the oxidation is being carried on are collected and led into a condenser—thus nothing is lost.

Although nitric acid is employed, the solution obtained when the lead is all dissolved contains no nitrate of lead. On evaporating slowly, crystals of lead acetate are gradually thrown down. The expense of producing sugar of lead by this new method is asserted to be much less than by any other.—*Deutsch. Indust. Zeitung.*

* "Guatemala, The Land of the Quetzal." 8vo, London, 1887.

Norwegian Cod Fisheries.

THE principal cod-fishing, which takes place in the district of Lofoten from middle of January to middle of April, finished with a result of 17,000,000 fish, 20,300 barrels of liver, 17,000 barrels of spawn, and 11,100 barrels of crude steam-rendered oil. The gross value of the catch is estimated at \$1,554,500. The returns of last year's catch were 26,000,000 fish, 32,700 barrels of liver, 33,600 barrels of spawn, and 13,800 barrels of crude steam-rendered oil. The gross value of the same was estimated to be \$1,600,000. In the year 1887 the fishing in Lofoten yielded 29,700,000 codfish; in 1886, 31,000,000; and in 1885, 26,600,000; this season's catch is thus the smallest for a number of years. The large deficiency is partly to be attributed to roughness of the weather during the fishing season, and partly to scarcity of fish present on the fishing grounds. It was repeatedly stated by the inspectorate of Lofoten, as a reason for the poor catch, that when the weather permitted fishing the fish remained in deep sea and did not run up on the banks, on account of a low temperature of the sea. This unusual phenomenon lasted during the whole season.

The fish were this season of smaller size than last year; the fatness of the liver was, however, about the same, viz., from 250 to 350 fish per hectoliter of liver (hectoliter = 2.838 bushels). At the end of the season the liver of the fish is always leaner than in the beginning. The prices paid for the fish were very high, and began with 20 kroners (kroner = 26.8 cents) per 100 fish early in the season, and advanced to 30 kroners later on. The average gross profit for each fisherman is estimated at \$51, against \$50 in 1888. The profit for the fishermen was, however, most unevenly divided, on account of the catch being good at some places while very poor at others. Many of the fishermen had thus to return to their homes without profit at all. The number of fishermen that participated in the catch is stated to have been 30,080. The highest number of boats present was 7,043, and of vessels buying fish 644.

The returns of the catches taking place in the adjoining districts have not yet been issued. They are, however, all of less importance, as the fishing in those districts was constantly interrupted by stormy weather.

In the southern fishing district of Sondmore this season's catch was successful. The returns thereof were 5,000,000 fish, 13,000 barrels of liver, 9,400 barrels of spawn, and 3,900 barrels crude steam-rendered oil. In the neighboring district of Romsdal the fishing yielded 2,000,000 codfish.

In the Finmarken district, where the fishing has begun anew, the yield to date has been about 4,000,000. The latter district is, next to Lofoten, the most important, but the fishing there is also more treacherous than in any other district, and therefore not to be relied upon. The actual prospects for a continuance of the fishing in Finmarken are good.—U. S. Vice-Consul J. C. ISDAHL, Bergen.

The Manufacture of Essence of Lemon in Sicily.

THE United States consul at Messina describes the mode of manufacturing essence of lemon in Sicily. With three strokes of a sharp knife the cutter peels the lemon lengthwise and lets the peel fall into a tub under the chopping block. He then cuts the lemon in two and throws it from his knife into a bucket. He works with wonderful rapidity, and fills from 10 to 12 tubs with peel a day, and is paid 2½d a tub weighing 77 pounds. His left hand and right index finger are protected with bands of osenaburg or leather. The fresh peel is soaked in water fifteen minutes before the essence is extracted. Peel that has stood a day or two remains soaking from thirty to forty minutes, that it may swell and offer a greater resistance to the sponge. The workman holds a small sponge in his left hand, against which he presses each piece of peel two or three times—simple pressure, followed by rotary pressure. The women employed in this work run a piece of cane through their sponges to enable them to hold them more firmly. The outside of the peel is pressed against the sponge, as the oil glands are in the epicarp. The crushing of the oil cells liberates the essence therein contained. The sponge, when saturated with the essence, is squeezed into an earthen vessel held in the lap. The peel is so thoroughly pressed that not a single cell escapes. This is ascertained by holding the pressed peel to the flame of a candle; should it neither crackle nor diminish the brilliancy of the flame, the cells are empty. This process yields, besides the essence, a small quantity of juice and feccia (dregs). The separation of the essence, juice, and feccia soon takes place if the vessels are not disturbed; the oil floats on the juice, and the dregs fall to the bottom. These three products derived from the peel have no affinity with each other. As the essence rises to the surface it is skimmed off, bottled, and left to settle for a few days. It is then drawn off with a glass siphon into copper cans, which are hermetically sealed. After the essence has been expressed, a small quantity of juice is pressed from the peels, which are then given to oxen or goats, or thrown on the manure and well rotted, or they would make too heating a fertilizer. The yield of essence is variable. The industry is

carried on five months in the year. Immature fruit contains the most oil. From November to April in the province of Messina 1,000 lemons yield about 14 ounces of essence and 17 gallons of juice. The essence is so valuable that the workmen are closely watched, for they are most ingenious in secreting it about their persons. Six men work up 8,000 lemons a day; two cut off the peel, while four extract the essence and obtain 136 gallons of lemon juice and 7 pounds of essence. Dealers sometimes (?) adulterate their essences with fixed oils, alcohol, or turpentine, but these mixtures may be easily detected. The essence of bitter orange mixed with the essence of lemon produces an aroma similar to that of the essence of bergamot.—Br. and Colonial Drugg.

Perfumery Formulæ.

A CORRESPONDENT of the *Chemist and Druggist* has furnished the following four formulæ for eau-de-cologne:

	I.	II.	III.	IV.
Oil of Bergamot.....	½ oz.	12 min.	7½ drch.	6 drch.
" " Lemon.....	½ oz.	12 min.	2 drch.	1 oz.
" " Rosemary (Engl.)....	1 drch.	12 min.	10 min.	½ drch.
" " Citronella.....	20 drops	....	....	....
" " Neroli.....	1 drch.	12 min.	2 drch.	1 drch.
" " Orange Peel.....	....	12 min.	2 drch.	....
" " Lavender (Engl.)....	....	....	20 min.	1 drch.
Tinct. of Musk (13 in 10 oz.),	....	....	....	4 drch.
Cardamom Seeds, powd.....	....	60 grs.	....	....
Orange Flower Water.....	....	....	17½ oz.	....
Alcohol	83 oz.	1 pint	66½ oz.	4 pints

N.B.—The weights and measures are understood to be British.

Some New Compounds of the Quinine Alkaloids.

THE compounds of phenol with some salts of the quinine alkaloids of left-handed polarization have long been known and are much used as febrifuges, as, e.g., quinine phenol sulphate (C₂₀H₂₄N₂O₄SO₄·C₆H₅O+2H₂O). The author has recently prepared a new compound of phenol with quinine bisulphate. If carbolic acid be added, in equivalent proportion, to a hot aqueous solution of quinine bisulphate, on cooling at first an oily mass separates out, above which delicate white needles are gradually formed, of the composition C₂₀H₂₄N₂O₄·SO₄·C₆H₅O+3H₂O. This compound is very unstable. If it be dissolved in hot water, on cooling the first-named normal salt crystallizes out. Quite in accordance with this is the behavior of the acid quinine resorcinol sulphate, the acid quinine quinol sulphate, the acid quinine pyrogallol sulphate, and the acid cinchonidine pyrogallol sulphate, for, one and all, they separate out the normal salts when the attempt is made to recrystallize them from hot water. The author further prepared and describes the normal quinine orcinol sulphate, quinine catechol sulphate, cinchonidine quinol sulphate, as well as the quinine resorcinol, quinine catechol, and quinine pyrogallol hydrochlorides. They are beautifully crystallized compounds and some of them excellent febrifuges.—J. Hesse in *Ph. Zeit.* and *J. Soc. Chem. Ind.*

Dithio-salicylic Acid.

WHILE working in the chemical laboratory of the Society of Physicians in Frankfort-on-the-Main, Herr H. Baum, chemist, recently discovered a substance which is likely to compete with salicylic acid as a remedy and antiseptic. This new substance, dithio-salicylic acid, consists, as it were, of 2 molecules of salicylic acid concatenated into 1 molecule by 2 atoms of sulphur (the *Lancet*). The well-known bacteriologist, Professor Hueppe, of Wiesbaden, has ascertained that a 20-per-cent solution of sodium-dithio-salicylate kills anthrax spores in forty-five minutes, whereas sodium salicylate under the same conditions has no perceptible effect. Its effect on cholera and typhus bacteria, on the bacterium of green pus, and on the staphylococcus aureus, is much stronger than that of sodium salicylate. Sodium-dithio-salicylate II. (there is a similar substance called sodium-dithio-salicylate I.) has been tried in many cases of acute rheumatic fever in Dr. Knoblauch's wards in the city hospital of Frankfort. In the lighter cases a dose of 3 grains was given every morning and evening; in the severer ones the same dose every morning and two, three, or four times an hour every evening. In slight cases pain, fever, and swellings disappear after two days; in severer ones, after six days at most. As compared with sodium salicylate, sodium-dithio-salicylate possesses the following advantages: Stronger effect and consequent adequacy of smaller doses, no bad effects on stomach, heart, and vessels, no collapse, no humming in the ears. A Frankfort physician had given a patient who was suffering from acute rheumatic fever 6 ounces of sodium salicylate without any essential alleviation. He then tried the new remedy, giving the patient four doses of 3 grains daily, which cured him in five days.

Ipecacuanha for Insect Bites.—An application for insect bites, said to be in common and successful use in India, consists of ½ ounce each of powdered ipecac and alcohol and ½ ounce of sulphuric ether.

Standardized Preparations of Ipecac.*

THE authors propose to employ a fluid extract of ipecacuanha of standardized emetine strength as a basis for the various fluid preparations of the drug, particularly the wine. They find that when the root is treated first with rectified spirit, and subsequently with the same menstruum in conjunction with lime, complete removal of the emetine is effected. A fluid extract so prepared is afterwards standardized so as to contain 1.25 parts of emetine in each 100 fluid parts of the extract. This estimation is effected by a modification of Ransom's process, in which the impurities existing in the crude extract are removed by basic lead acetate, the resulting alkaloidal filtrate being titrated by Mayer's solution. Throughout the experiments the same sample of assayed root was employed, and results verified by estimating the alkaloid in the marc as well as in the various extracts.

From the standardized fluid extract they prepare the wine by diluting it to 20 volumes with sherry, allowing to stand, and filtering. It is claimed that the wine so produced is fully equal to that of the present Pharmacopœia in elegance, while it considerably exceeds it in alkaloidal strength.—*Chem. and Drugg.*

[Another paper by the same authors, on "Vinum Ipecacuanhæ Brit. Ph.," is abstracted in the following:—]

Applying to the wine the method of assay described in the previous note, the authors find, when prepared by the official process, although the root is exhausted, a portion of the emetine is subsequently lost. This loss is traced to the heating necessary to produce the powdered extract. Examination of "trade samples" confirms the results obtained on the small scale with assayed root. The figures for emetine obtained from a volume of wine equivalent to 10 parts of root range from 0.1077 to 0.0378. Out of 11 samples examined, however, 7 give between 0.0756 and 0.066. A sample of wine prepared by the process of the previous (1867) Pharmacopœia gave 0.1228 part of emetine; a similar volume of the official wine made from the same root gave 0.0812 part, the root itself 0.132 part. The conclusion arrived at is that, although the present process fairly exhausts the drug, the subsequent loss of a part of the emetine renders the preparation much less rich in its active ingredient than its predecessor, notwithstanding that it is admitted on all hands to be a more "elegant" preparation.

Specimens of standardized fluid extract and of the wine prepared from it were shown; also "Vinum Ipecacuanhæ Brit. Ph. 1885," made at the same time and from the same ingredients. It was seen that the standardized wine was quite as elegant as, if not more so than, the less active official preparation.

Gelatin—What it is, and the Process of its Manufacture.

THE term gelatin, says a contemporary, although usually applied to only one variety of the substance obtained by dissolving the soluble portion of the gelatinous tissue of animals, nevertheless properly belongs also to isinglass and glue, which are modifications of the same material. Vegetable jelly is also analogous, and will be mentioned under this head. Gelatin and glue signify the more or less pure and carefully prepared jelly of mammalian animals, but the term isinglass is applied only to certain gelatinous parts of fishes, which, from their exceeding richness in gelatin, are usually dried and used without any other preparation than that of minute division for the purpose of facilitating their action.

Gelatin (proper) is prepared for commercial purposes from a variety of animal substances, but chiefly from the softer parts of the hides of oxen and calves and the skins of sheep, such as the thin portion that covers the belly, the ears, etc., also from bones and other parts of animals. The general method adopted with skin parings or hide clippings is first to wash the pieces very carefully; they are then cut into small pieces and placed in a weak solution of caustic soda for a week or ten days, the solution being kept moderately warm by means of steam pipes. When this process of digestion has been sufficiently carried on, the pieces of skin are then removed into an airtight chamber lined with cement, and here they are kept for a time, determined according to the skill of the manufacturer and the kind of material employed, at a temperature of 70° F. They are next transferred to revolving cylinders supplied with an abundance of clean cold water, and afterwards are placed, still wet, in another chamber lined with wood, in which they are bleached and purified by exposure to the fumes of burning sulphur; they next receive their final washing with cold water, which removes the sulphurous acid. The next operation is to squeeze them as dry as possible, and transfer them to the gelatinizing pots, which are large earthen vessels inclosed in wooden cases made steam tight. Water is poured in with the pieces and kept at a high temperature by means of the steam in the cases surrounding the pots. By this means the gelatin is quite dissolved out of the skin, and is strained off while still hot; it is poured out in thin

layers, which, as soon as they are sufficiently cooled and consolidated, are cut into small plates, usually oblong, and laid on nets, stretched horizontally, to dry. The cross-marking observable on the plates of gelatin are the marks left by the meshes of the nets.

Another process consists in treating pieces of calfskin by water alone, without the soda and sulphur processes; the pieces after simple washing being transferred at once to the pots to be acted upon by the steam. Undoubtedly this is the purest, but expense of preparing it prevents its general use. Inferior gelatin is made from bones and other parts of animals, and it has been stated by an eminent authority that in Paris the enormous number of rats which are occasionally killed in the sewers and abattoirs, after being deprived of their skins, which are reserved for other purposes, are all used by gelatin makers. These materials are placed in cages of wire, which are placed in steam-tight boxes, where they are submitted to the direct action of steam at 223° F., but at a low pressure; and cold water, supplied by another pipe through the upper part of the box, is allowed to flow slowly and percolate through the contents of the cage. The water and condensed steam descend to the bottom charged with gelatin, and are drawn off by a stop-cock placed there for the purpose.

The French manufacturers succeed better than any others in clarifying the inferior gelatins, and they rarely make any others; they run their plates out very thin, which gives them greater transparency and apparent freedom from color; and they color them with most brilliant colors and form very fine rolled sheets, tempting the eye with an appearance of great delicacy and purity, which would at once disappear if the material were made up into thicker plates.

The purity of gelatin may be very easily tested thus: Pour upon dry gelatin a quantity of boiling water; if pure it will form a thick, gluey, colorless solution, free from smell; but if made of impure materials it will be of a very offensive odor and have a yellow, gluey consistence. No article manufactured requires such careful selection of material and such nice and cleanly manipulation to insure a good marketable character; and those anxious for purity should avoid all artificially-colored varieties, however temptingly got up, unless they are required for merely decorative purposes and not for food.

How to Use Gold Leaf.

GOLD leaf is a thing which it is impossible to manage unless one knows how, and yet we often have occasion to repair gilt articles of various kinds, or "touch up" a picture frame, etc. The usual practice is to apply some of the many gold paints, and the invariable result is a nasty patch, which to a critical eye is worse than the original flaw.

But besides patching and mending, gold leaf is highly effective in combination with black for the ornamentation of various articles of furniture which amateurs often construct for themselves. A book of "gold leaf" which is quite good enough for such uses may now be bought cheaply; indeed, this German gold is quite as good for inside work as the "real thing."

Having procured a book, lay it flat upon a table and carefully open the first leaf, when the metal foil will lie before you; with a pair of sharp scissors cut off the paper leaf you have just raised; lay it flat upon your open hand and rub it on your hair; whether you use pomatum or not, there will be sufficient grease to answer the end in view. Now lay the paper upon the foil in the original position and press firmly with the hand; lift carefully, and the gold will be found adhering. This paper leaf, with foil attached, will now bear to be carried about, and may be cut up with scissors to size and shape required. The same process may next be carried out for as many leaves as we need for the job in hand.

Having said so much about gold leaf, we add a hint as to the method of laying it on, in case the reader does not know.

Paint the part you wish to gild with gold size, and be very accurate, as the leaf will stick to every spot touched; this size will dry rapidly, and when it is just not dry, or "tacky," i.e., sticky, cut a piece of your leaf a little larger every way than your design, etc., press it firmly, and then lift the paper; do not touch it again till quite dry, when you may remove the surplus foil with a large, soft camel's-hair brush, or "dabber."

For illuminations, etc., gum arabic may be used instead of gold size, and may be allowed to dry, breathing upon it for a few seconds when you wish to apply the gold.—*Oil and Colorman's Journal.*

Purification of Naphthalene.—It has recently been found that by treating boiling naphthalene with $\frac{1}{4}$ to 2 per cent of its weight of sulphur the impurities are decomposed, sulphuretted hydrogen being evolved, and bodies of high boiling point being formed; from these the naphthalene can easily be separated by distillation. The sulphuretted hydrogen may be absorbed by soda or milk of lime. This is considered a great improvement on the old sulphuric-acid method.—*Chem. and Drugg.*

* Abstract of a paper by J. OLDFIELD BRATTWATTS and JOHN C. UMBREY, read at the recent British Pharmaceutical Conference.

The Cutting of Spectacle Lenses.

THE work of cutting is all performed with a tiny fragment of diamond, known in the trade as a spark. It is not every spark, however, that will cut a lens. The sparks are mounted in the following manner: A piece of brass wire is selected, say $\frac{1}{16}$ of an inch in diameter, a hole is drilled in the end large enough to admit the spark, and it is set in the hole with the point up. The outer edge or shell of the wire is beaten inward and holds the spark firmly in place. The wire is then placed in the lathe and cut off just back of the spark, turning the end hemispherical, using the point of the spark that sticks through the brass as a centre. A piece of steel wire is next selected of the same diameter as the brass wire, and the end is turned in, forming a cup. The mounted spark is then soft-soldered into this cup and it is ready for the machine, which works automatically from a pattern, and can be set to cut larger or smaller than the pattern. Before the mounted spark is placed in the machine, however, it is tested by holding the handle upright. If it does not cut in an upright position, the point is unsoldered by means of the blowpipe and the handle resoldered, leaving the cutting point at the required angle, while the handle itself is upright. When the spark is found to cut well in an upright position, it is then placed in the machine for trial. The glass is placed upon a pad under the spark, the glass varying in form according to the kind of lens being cut. If the lens is flat, the pad is also, and if the lens is convex the pad is concave and must be a perfect fit; for the better the fit, the more accurate will be the work. The pattern and glass travel around while the diamond remains stationary.

The life of a spark is short; some lasting only one day, while once in a while they can be worked for a year. The workmen average fifty dozen pairs of lenses per day. A good diamond will cut an average of 1,500 dozen pairs. The average lens measures four inches around, and a dozen pairs would be eight feet. In cutting 1,500 dozen pairs the spark would travel over a surface equal to a piece of glass 12,000 feet long. There are exceptional sparks that cut for months. I now have one which has been in operation for fifteen months and has cut 7,200 dozen pairs, travelling about 57,600 feet. We use two kinds of sparks, the Brazilian and the African, and they cost from \$3 to \$5 each.—*The American Jeweler.*

Note on Hypophosphorous Acid as a Solvent for Strychnine and Morphine.*

IN searching for readily soluble salts of strychnine and morphine for hypodermic medication, I was struck with the extreme solubility of both alkaloids in dilute hypophosphorous acid; and the ease with which these alkaloids dissolve to form neutral, or practically neutral, solutions, when hypophosphorous acid is employed, points to a possibly advantageous use of such compounds for hypodermic injections.

In the case of hypophosphite of strychnine, it appears to be a very stable salt in solution, and hypophosphorous acid might, I think, be usefully employed, not only to form a hypodermic injection, but in place of the hydrochloric acid ordered for making liquor strychninæ, P. B., as the official preparation sometimes gives trouble in cold weather from the separation of crystalline matter.

The morphine combination also appears to keep better in solution than the acetate, and would more easily afford a stronger solution than the official "Injectio morphinæ hypodermica," in cases where such was required.

A solution of 1 in 6 is sometimes wanted, and the ready solubility of hypophosphite of morphine allows of this being easily made, or even of a very much stronger solution. Thus, for a concentrated injection intended for veterinary use, I found no difficulty in preparing a solution four times the strength of the official injection.

The solutions so produced with hypophosphorous acid, and using a slight excess of morphine or strychnine, are neutral, or only very faintly acid. In the case of morphine I have found it advantageous to make a decidedly strong solution, to estimate the morphine, and dilute to the required strength.

Morphine hypophosphite is so readily soluble that crystals only separate from a thick, syrupy mother-liquor after keeping for some time.

Strychnine hypophosphite can be more easily obtained, as, although exceedingly soluble, the highly concentrated solution solidifies on cooling to a crystalline mass, from which the salt can be separated.

The salts of both alkaloids would well repay an extended examination, both as to composition and solubility.—*Chem. and Drugg.*

Danger in Silk Thread.—Silk thread is soaked in acetate of lead to increase its weight, and persons who pass it through the mouth in threading needles, and then bite it off with the teeth, have suffered from lead-poisoning.—*Sanitary News.*

* Abstract of a paper by H. W. JONES, F.C.S., read at the recent meeting of the Brit. Pharm. Conference.

A Substitute for Glass.

THE new translucent substance intended as a substitute for glass has been adopted for some months in some of the public buildings of London, and various advantages are claimed for it, among these being such a degree of pliancy that it may be bent backward and forward like leather, and be subjected to very considerable tensile strain with impunity; it is also almost as transparent as glass, and of a pleasant amber color, varying in shade from very light golden to pale brown. The basis of the material is a web of fine iron wire, with warp and weft threads about one-twelfth of an inch apart, this being inclosed, like a fly in amber, in a sheet of translucent varnish, of which the base is linseed oil. There is no resin or gum in this varnish, and, once having become dry, it is capable of standing heat and damp without undergoing any change, neither hardening nor becoming sticky. Briefly, the manufacture is accomplished by dipping the sheets edgewise into deep tanks of varnish, and then allowing the coating which they thus receive to dry in a warm atmosphere. It requires somewhat more than a dozen of these dips to bring the sheets to the required degree of thickness, and, when this has been accomplished, the material is stored for several weeks to thoroughly set. This fabric might be worth testing for those parts of studios through which a subdued light only is desired. As the substance contains no resin and is practically solidified balloon varnish, there may be hopes of comparative durability.—*Photo. News.*

Examination of Commercial Peptones.

THE methods hitherto in use for estimating the soluble and non-coagulable proteids (the albuminoses and peptones) are far from satisfactory. The precipitation of the albuminoses by ferric acetate, with subsequent precipitation of the peptones by sodium phosphotungstate, yields very discordant results. J. Koenig and W. Kisch adopt the method of Kühne and Chittenden—precipitation of the albuminoses with a saturated solution of ammonium sulphate, and in another portion of the precipitation of both albuminose and peptone by sodium phosphotungstate, and estimation of the peptone from the difference. From 5 to 20 Gm. of substance (according to the proportion of water it contains) are taken. The insoluble matter and coagulable albumen are separated by filtration and by boiling, and their amount determined. This is preferably effected by Kjeldahl's nitrogen process. Multiplication of the nitrogen found by 6.25 gives the amount of albumen more correctly than direct weighing. The filtrate is made up to 500 C.c. : of this 50 C.c. or 100 C.c. are evaporated to about 10 C.c. of a saturated solution of ammonium sulphate in the cold. The precipitate is filtered off, washed with ammonium sulphate solution, dried, and weighed, and the ammonium sulphate adhering is ascertained by a sulphuric-acid determination and deducted. Of the same filtrate 50 C.c. or 100 C.c. are acidified with sulphuric acid, and precipitated with a strongly acid solution of sodium phosphotungstate. The precipitate is washed with dilute sulphuric acid, and the nitrogen it contains is determined. Although albuminose and peptone contain less nitrogen than albumen, the same multiplier should be used, as this will to some extent compensate for the traces of other nitrogenous substances precipitated at the same time.

Salkowski gives the following differences between albumen-peptone, gelatin, and gelatin peptone (a 3½-5 per cent solution being used):

	Albumen-peptone.	Gelatin.	Gelatin-peptone.
5 vols. of glacial acetic acid and 5 vols. of sulphuric acid mixed.....	violet	yellowish	yellowish
An equal volume of concentrated sulphuric acid in the cold.....	dark-brown	yellow	yellow
Millon's reagent.....	reddish p. p.	colorless	colorless
Solution boiled with $\frac{1}{2}$ vol. of nitric acid (1.2), then made alkaline with soda	deep orange	lemon-yellow	lemon-yellow

—J. Chem. Soc.

Stockman's Test for the Purity of Cocaine.

DR. RALPH STOCKMAN has proposed the following test for ascertaining the purity of cocaine:

When pure cocaine is heated with strong hydrochloric acid in a sealed glass tube in the water-bath, it splits up into its components without any change of color, except a very light yellow tint. When isotropylcocaine is so treated, it splits up into ecgonine and a brown, oily-looking body, which is decomposed isotropic acid. With long boiling a black body is deposited. Upon trying this reaction, Dr. Squibb found that the sealed tube and water-bath were not essential, and that the process might be

very useful as a test for the purity of cocaine. He accordingly directs 5 Gm. of the powder and 2 C.c. of strong hydrochloric acid to be put into a small test tube and carefully warmed over a gas flame until the decomposition is complete, as indicated by the end of the effervescence and the commencement of boiling. Perfectly pure cocaine, or hydrochlorate of cocaine, when thus treated yields an almost colorless solution, and the depth of color indicates the amount of impurity. The best crude cocaine yet met with gives a color of the depth of ordinary brandy, but a large proportion of the parcels give solutions many shades darker, and some of the earlier and worst specimens give black solutions. Good hydrochlorate of cocaine tested in this way gives a nearly colorless solution, or, at most, a pale wine tint. On standing for a few hours, these solutions give fine groups of crystals.

Antipyrine and Some of its Reactions.

1. Antipyrine and Iodine.

MANSEAU contributes a paper to the *Apotheker Zeitung* concerning the relations of antipyrine and iodine, from which the following is abstracted: If, to a solution of antipyrine, iodine in solution be added drop by drop, the mixture remains clear and the iodine is chemically united with the antipyrine. Suddenly the conditions are altered, the liquid takes on a reddish-brown color, and a permanent precipitate is thrown down. The author takes this reaction as the base of a process for testing the purity of antipyrine and the demonstration of its presence in urine.

2. Determination of the Value of a Sample of Antipyrine.

According to the same author, 1 Gm. of antipyrine is dissolved in 100 Gm. of water, 10 C.c. of a 1-per-cent starch solution are added, and the whole heated to 40° to 42° C. (104° to 109° F.). From a burette, an iodine solution containing 14.39 Gm. of free iodine to the liter is allowed to flow into the heated mixture, drop by drop, until a permanent blue coloration is obtained. Pure antipyrine should require 6 C.c. of such a solution (or 0.08634 Gm. of free iodine) to produce this reaction. While chlorine and bromine solutions give the same reaction, preference is given to iodine on account of the constancy of the titration possible with the latter.

3. Determination of Antipyrine in the Urine.

The same author states that he has no objection to the test hitherto used for this purpose (to wit, the chloride-of-iron test), except that it is not sufficiently delicate. Urine that contains less than 20 or 25 Cg. of antipyrine to the liter (say 3 or 4 grains to the quart) is not affected by it, while mere traces are demonstrated by the iodine reaction. The following is the method of procedure:

From 10 to 20 C.c. of urine are put into a test tube, and a few drops of an iodo-iodide solution (iodine 12.5 parts, iodide of potassium 25 parts, water 1,000 parts) are added. If no precipitate follows, no antipyrine is present. If any precipitate which does not vanish on agitation be formed, we may reckon upon the presence of alkaloids (quinine, strychnine, etc.). If the precipitate be again taken up on agitation, it is possible, on the contrary, that, instead of antipyrine, certain ferments are present. In this case, proceed by adding for each 10 C.c. of a fresh sample of the urine 2 minims of nitric acid and 10 minims of the iodine solution. Ferments give only a slight perturbation of the fluid, while antipyrine gives a rich, dark-red precipitate. If it be desirable to make absolutely certain of the result, take 10 C.c. of the urine, add 2 or 3 C.c. of starch solution, and then the iodine solution drop by drop, until a permanent blue is obtained. If antipyrine be present, the blue color will vanish on heating the mixture, giving place first to a violet, and finally disappearing altogether.—*Nat. Drugg.*

Mr. James Kennedy, of San Antonio, Texas, read a paper, at the last annual meeting of the Texas Pharmaceutical Association, on the subject of antipyrine, from which we take the following passages referring to reactions of antipyrine:

I have endeavored to utilize the incompatibility of nitrous ether with antipyrine in the quantitative estimation of ethyl nitrite, but in this attempt I have met with only partial success.

Operating upon a strictly pharmacopoeial preparation recently made, I found that, with 9 C.c. added to 2 C.c. of a 4-per-cent solution of antipyrine, the mixture diluted with 15 C.c. of water, and heated just to ebullition, and allowed to stand from thirty to forty-five seconds, a distinct green coloration results. I found, further, that a smaller quantity of the preparation will not produce the green coloration within the prescribed time, requiring, instead of one and one-quarter minutes, from two to ten minutes or more.

In order to obtain accurate results, it is necessary to observe the following conditions: Take a tube 15 Cm. in length and about 12 Mm. in width; pour into it 2 C.c. of an aqueous 4-per-cent solution of antipyrine, add 15 C.c. of water, and place the tube in the flame of an ordinary spirit lamp, holding it in an inclined position, so that the flame shall come in contact with the tube midway between

the meniscus and bottom of the tube; heat for one-half minute, revolving the tube in the flame; place the tube against a white background and let it stand three-quarters of a minute, and the green color becomes distinctly perceptible, most marked in the middle and upper half of the tube.

This test, however, is only available for determining whether the specimen is up to standard or below it. With a weaker preparation than the official, the increased volume of alcohol retards the reaction for so long a time that the utility of the test is destroyed.

A Test for Antipyrine.—The facility with which ethyl nitrite decomposes in the presence of water makes it an admirable reagent for the detection of antipyrine in solution, producing a well-marked and characteristic reaction with 1 part of antipyrine to 5,000 parts of water. As the presence of alcohol has a retarding influence in the decomposition, upon which this test depends, pure ethyl nitrite should be used.

It is only necessary to add the ethyl nitrite to the solution of antipyrine contained in a tube, and agitate, when a distinct green coloration will be produced, the intensity varying, of course, according to the amount present. With amyl nitrite this action is not so delicate.

Dr. Conquil, in the department of New Remedies ("Wood's Medical and Surgical Monographs"), March, 1889, says: "The most palpable reaction of antipyrine is the reddish-brown precipitate which it gives in the presence of potassium iodide." This is clearly an error; for in the presence of potassium iodide alone no precipitation occurs. A reddish-brown precipitate is produced by a solution of free iodine, however, and this probably is the explanation of his mistake. But in the same article the doctor recommends a gargle consisting of antipyrine, tincture of iodine, and potassium iodide, which prescription is incompatible, and will furnish an abundance of the reddish-brown precipitate which he attributes to potassium iodide.

As previously stated, antipyrine treated with Nessler's reagent (mercur-potassic iodide) gives rise to a new compound of a peculiar character. On admixture of the two, the solution becomes opaque, and after a time separates into two distinct strata—the lower one very dense and heavy, oily in appearance, clear and of a yellow color. It is decomposed by water, becoming opaque and depositing a yellow precipitate which afterwards becomes scarlet.

It is miscible with alcohol without decomposition.

Treated with chlorine water it is decomposed, liberating iodine.

This interesting compound contains mercuric iodide in considerable quantity united with antipyrine, and the precipitate obtained by treating the supernatant fluid (from which mercuric iodide has been separated by the dilution with water) with tincture iodine indicates that the compound resolves itself into antipyrine and mercuric iodide.

Mercury Benzoate.

ONE hundred and twenty-five parts of mercuric oxide are dissolved in 250 parts of nitric acid (1.20 sp. gr.), the solution diluted with 4,000 parts of water and filtered; to this a solution of 188 parts of sodium benzoate in 4,000 parts of water is gradually added with agitation. The voluminous precipitate of mercuric benzoate obtained, after washing, pressing, and drying, forms a light, white powder, soluble with difficulty in ether, alcohol, chloroform, and water.—E. LIEVENTHAL in *Ph. Zeit. f. Russl.* (and *J. Soc. Chem. Ind.*)

Cologne-Water.—T. Vyncer, of Nice, sends the following to the *Chemist and Druggist*, concerning which he says that in the distillation the neroli is not mixed with the other ingredients, but added to the distillate. The essences are in the proportion of 1 in 72 only, and everything depends upon their freshness and quality:

	Parts.
Ess. Portugal.....	15
" Lemon.....	15
" Bergamot.....	6
" Neroli.....	1
" Petitgrain.....	1.50
" Rosemary.....	2
Spt. Wine.....	4,000

1 part essence in 100.

Test for Senega.—L. Reuter, of Heidelberg, offers the following test for the chemical identification of senega root, which is based upon the quite constant presence of methyl salicylate: 5 Gm. of dried and powdered senega are macerated for fifteen minutes with 50 C.c. of water, temperature about 60° C., filtered, the filtrate acidified with 3 drops official hydrochloric acid, and agitated with 50 C.c. of ether; the ethereal layer is decanted, and the ether allowed to dissipate spontaneously. There should be sufficient residue so that when treated with 20 C.c. of water at 60° C., and the solution with 1 drop of ferric chloride solution, a distinct violet color should be developed.—*Chem. and Drugg.*

Medicamentous Eruptions.

In his inaugural thesis for the doctorate, under the title of "Medicamentous Eruptions," Dr. Deschamps thus summarizes the common characters and the course of the eruptions which may follow the administration of a medicament. Among the medicaments the employment of which may determine erythematous eruptions, the list is headed by copaiba, then follow belladonna, sulphate of quinine, turpentine, stramonium, protoiodide of mercury, bromide of potassium, syrup of poppies, the preparations of arsenic, etc. Those which produce vesicular affections are bromide of potassium, the alkaline iodides, cubebs, santoninate of soda. Those which give rise to pustulous affections are the iodides, arsenic, bromide of potassium. The papulous affections are produced by Fowler's arsenical solution, and by hydrochlorate of morphia in hypodermic injections. Bullous affections are produced by copaiba and sulphate of quinine. Hæmorrhagic affections are produced by sulphate of quinine and iodide of potassium. It may be seen from the above enumeration that the same medicamentous substances may give rise to different cutaneous affections, whence it may be concluded that the effects which are always due to the same physiological procedure, viz., the elimination of the medicament by the skin, vary a good deal as regards the different forms of eruption, according to the aptitudes of receptivity of individual idiosyncrasies. It goes without saying that the treatment of these eruptions should consist in the momentary cessation, or at least in the diminution, of the doses of the medicament, its suppression not being effected always without grave inconvenience.

Incense for Churches.—Gum olibanum, 9 ounces; benzoin, 5 ounces; storax, 2½ ounces; sugar, 2 ounces; cascarilla, 1½ ounces; saltpetre, 3 ounces. Powder and mix.—*Chem. and Drugg.*

Snuff for Cold in the Head.—Rabow declares that a snuff made of 2 parts of menthol, 50 parts finely ground coffee, and 50 parts powdered sugar is a sovereign remedy against fresh colds in the head.

To Prevent Bumping during Distillation.—Parkhill (*Pharm. Era*) recommends roughening the interior of flasks used for distillation by introducing a small amount of fluorspar with sulphuric acid and then warming. As soon as the hydrofluoric acid has acted upon the interior surface, the flask may be emptied and washed. With such a flask, the writer says, bumping is entirely prevented.

Dextrin, free from sugar, is proposed as an efficient substitute for gum arabic, and a German patent covering its manufacture has lately been issued. Starch is mixed with cold water to a consistence of thick cream and treated with 1 per cent of mineral acid. After twenty-four hours the acid is removed by washing, and the starch is again mixed with water to a cream and heated to 160°–170° C. by means of superheated steam until all the starch is converted. The solution is then filtered and dried by evaporation.

A New Fothergill Pill.—John Aulde, M.D., gives in the *Medical and Surgical Reporter* of September 14th a résumé of the history of the so-called "Fothergill's Pill," and suggests its modification as follows:

Strychnine Sulphate	gr. ½
Powdered Ipecacuanha	gr. ½
Powdered Black Pepper	gr. ½
Extract of Gentian	gr. 1
Oil of Cloves	gtt. ½

M. et fiat pil. no. 1. Sig. Take after each meal.

Balm of Gilead Salve.—Mutton tallow, ½ pound; balm of gilead buds, 2 ounces; white pine gum, 1 ounce; red precipitate, ½ ounce; white sugar, 1 tablespoonful. Stew the buds in the tallow until the strength is obtained, and press out or strain, scrape the soap, and add it, with the other articles, to the tallow, using sufficient unsalted butter or sweet oil to bring it to a proper consistence to spread easily on cloth. When nearly cool stir in the red precipitate, mixing thoroughly. This may be more appropriately called an ointment.

This is an old-time remedy, having been used in this country for about fifty years.—*Formulary.*

Composition of Washing Powders.—L. O. Janeck and E. M. Poet, of the Wisconsin School of Pharmacy, have examined a number of the popular washing powders sold in the United States, and report their results in the *Western Druggist*. "Pearline," sold in pound packages at 15 cents, consisted of anhydrous soda 52½ per cent, soap 35 per cent, and the rest water lost in drying. "Soapine," sold in 6-ounce packages at 5 cents, "Boraxine," "Gold Dust," "Ivoryine," "Babbitt's 1776 Soap Powder," and "Acme Soap Powder" were all similarly composed, though the proportions of soap and soda varied to some extent. A sample of a certain "washing crystal," retailing at 3 cents for 2 ounces, was effloresced soda simply.

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FREDERICK A. CASTLE, M.D. EDITOR.

CHARLES RICE, Ph.D. ASSOCIATE EDITOR.

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EDITORIAL.

As the time approaches for the Convention to provide for revision of the Pharmacopœia, the difference in the attention paid to it by pharmacists and by physicians becomes quite notable. While nearly every pharmaceutical society and journal in the country has given an expression of views regarding one or more of the questions involved, hardly a medical society or journal has given it passing notice, and one would infer from their apathy that physicians have no interest in standards of purity and strength for the articles which they are compelled daily to use.

THE proverb that although you may lead a horse to water you cannot make him drink, is applicable to the present situation; for, although provisions may be made for a proper representation of the medical profession in the revision of the Pharmacopœia, no one can oblige its members to take part in the work.

WHILE the number of articles on the subject of the next revision which have appeared in pharmaceutical journals is already considerable, it is a matter of some moment that so few are of much practical importance, and that so many put the cart before the horse by discussing such matters as the price of and manner of publishing the book, or details which the Convention or committee will be quite competent to arrange when the time comes for doing so; whereas the matters of real importance—such as the articles to be included, nomenclature, details of working formulas, percentage of active ingredients, methods for assuring uniformity and permanence of products—receive comparatively less attention.

Much of this may be owing to the assumed necessity for a certain amount of editorial comment in each issue upon questions of the day; in other cases, it is evidently with a view to keeping the writer and his personality in the minds of the readers and for purposes of advertisement.

AMONG the things to be regarded in the forthcoming revision should be the avoidance, as far as possible, of sectional, professional, or personal bias in the preparation of the work, and when it is completed it should show, as little as possible, favoritism of the interests of any one of these classes.

Those who remember the circumstances attending the Convention of 1880 know the effort then made to take the management of the Pharmacopœia out of the control of a private publication, and it is to be hoped that in the Convention of May next it will be decided to distribute the responsibility for the character of the next revision over a still wider field.

It must be noted that the number of bodies entitled to send delegates is very considerably greater than ever before, not only under the former limits, but by the vote of the last Convention, and there is now no obstacle to prevent *all* the incorporated medical societies in the country—eclectic, homœopathic, and others—having representatives in the Convention.

WITH the aid of the hektograph, it was demonstrated to the present Committee of Revision that it is no longer requisite that a majority of the Committee should be within convenient travelling distance of each other, and, by its use, that every member of a large committee can not only be kept informed of the progress of the work, and be able to freely express his views, but also have in his constant possession a complete record of all that is being accomplished.

EDISON's phonograph has scarcely, as yet, passed the period of "novelty and curiosity," but many practical applications of the instrument have already been suggested, and have in some cases been actually carried out. There is one application, however, which we have so far not heard mentioned, and that is the instruction in the pronunciation of foreign languages. It is impossible to learn to speak a foreign modern language by self-instruction, since the true pronunciation can only be acquired by personal intercourse with one who is a native or equal to one in linguistic perfection. In the future the publishers of manuals of instruction in foreign languages will find it, most likely, a paying undertaking to publish a phonographic key of the various exercises, thus enabling the learner to acquire the correct intonation and pronunciation by causing the phonograph to repeat the word or sentence until it has been perfectly imitated by himself. Perhaps this suggestion may be thought to be foreign to the purposes of a pharmaceutical journal. But our profession is so situated, in many parts of the country, that a knowledge of more than one language is almost a necessity. And while actual instruction by a competent teacher is certainly the best method, the substitution of the phonographic method appears to us to be the next best in choice. We can only throw out the suggestion here, and must leave the practical execution to those who control the phonograph.

THE latest addition to drugstore facetiæ was given to us quite recently by the proprietor of a store in a fashionable locality, to whom came a lady with a manner which indicated a belief on her part that her patronage was the most important thing connected with the establishment, and a request for "two postage stamps, please." The postage stamps being given her, she asked their cost, and, this being stated, her next inquiry was to ask if the clerk was "quite sure that they were perfectly fresh"!

WE should have acknowledged our indebtedness to the *National Druggist* for the text of the decision by Judge Thayer, published on page 197 of our last issue.

Dr. George Buck, of Chicago, died on the 2d of October at the age of sixty-two years. Mr. Buck was born in Rochester, England, and came to the United States in 1855. His pharmaceutical training was acquired in England, and on his arrival here he became connected with the firm of J. H. Reid & Co., of Chicago, as prescription clerk. In 1859, with Mr. Raynor, also a clerk in the same house, he commenced business for himself. Mr. Buck was one of the charter members of the Chicago College of Pharmacy and its president from 1886 to the time of his death. He was a prominent actor in the movement which resulted in the enactment of the Illinois pharmacy law, and was the first president of the State Board of Pharmacy. He was well known by the public as well as by members of his profession as a man of great integrity and ability, and his death is a decided loss to the community in which he lived.

CORRESPONDENCE.

"Bromidia" and the United States Court.

ST. LOUIS, Oct. 21st, 1889.

GENTLEMEN:—We notice in the October number of the AM. DRUGGIST an article on the Bromidia cases, which was copied from the September number of the *National Druggist*. As the editor of the *National Druggist* has seen fit to make a correction in his journal of Oct. 15th, we hope you will be kind enough to do the same. The following is a copy of the correction (see *Nat. Druggist*, Oct. 15th, p. 131).

Yours respectfully,

C. A. BATTLE, V.-P.

A very mistaken idea as to the scope of the recent decision in the United States Circuit Court in the so-called "Bromidia cases" seems to have gotten abroad, and unless corrected may be the means of costing some of our friends among the retailers considerable money and trouble. Judges Brewer and Thayer, before whom the case against August Koch came up, did not decide that "Bromidia" was not a valid trade-mark, as one pharmaceutical journal states editorially, nor did they decide that the owners of trade-marks have no recourse against infringers, as another journal puts it; but they did decide that such infringers could not be prosecuted under criminal indictments. The grounds upon which this decision was rendered were, as stated in our last issue, that the statute of 1876 (which prescribes the method of procedure, and the penalties, in cases of violation of the trade-mark law of 1870), under which the indictments of Koch and others in the Bromidia matter were drawn, was void; that Congress had no power to pass such a law, because at the time of its enactment there was nothing upon which the act could operate. In other words, the judges (Judge Brewer delivering the opinion) took the view that the statute of 1870 having become defunct, by repeal, the act of 1876 providing criminal punishment for its violation was inert and void. This is not a new view of the matter by any means, but, as noted by Judge Brewer in his decision, was but a reassertion of the decision in the "trade-mark cases" of 1882. The decision in the Federal Court cannot, of course, affect proceedings under the State laws on the subject, nor does it in any way prevent the owners of a trade-mark from suing infringers for damages.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,384.—*Chemical Journals* (A. E. W., Raleigh, N. C.).

The *Chemist and Druggist* is published at 42 Cannon street, London, England, but has an agent, Mr. H. V. Dakers, at 45 Liberty Street, in this city.

The *Journal of the Society of Chemical Industry* is a monthly publication, especially valuable for those engaged in manufacturing. It should be addressed care of Eyre & Spottiswoode, East Harding Street, London, England.

The *Journal of the American Chemical Society*, likewise a monthly publication, can be highly commended, and may be addressed at 32 Waverly Place, New York City.

No. 2,385.—*Metabisulphite of Potassium* (Amateur).

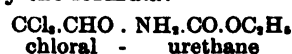
We have already given such information as was then accessible to us, in a former issue of this journal (see our last January number, page 20, and February number, page 39). Recently we learn that the salt was introduced into the market by Schuchardt, chemical manufacturer at Goerlitz, Germany. It may be had here from dealers in photographic chemicals.

No. 2,386.—*Chloral-Urethane* (Dr. F. G. S. and J. C. C. & Co.).

In our last number we answered a query (No. 2,373) referring to this substance. Since writing that answer, however, our attention has been drawn to the fact that there are at present not less than three different "chloral-urethanes" in the market, of which we give a short account in the following (Nos. 1 and 2 after Merck's Bulletin, July, 1889, and No. 3 after Gehe's October Report and a note in the *Chem. and Drugg.*):

1. *Chloral-Urethane*, crystalline, insoluble in water.

This is stated to be produced by the simple addition of 1 molecule each of chloral (anhydrous) and ethylic urethane (the ordinary urethane). Hence its constitution is represented by the formula:



As we stated in our last number, this is insoluble in cold water, and when treated with boiling water decomposes into its two original constituents. Alcohol and ether readily

dissolve it, and water separates it again from these solutions. It melts at about 103° C. (217° F.), but begins to be decomposed already at 100° C. The dose, as a hypnotic, was found by Hübner and Sticker to be 1 to 4 Gm. (15 to 60 grains).

2. *Uralium* (so called by its originator, Gustavo Poppi). This is reported to be likewise a chloral-urethane of the same ultimate chemical composition as No. 1. But as its properties differ, the grouping of the constituents must be different.

This substance is crystalline, of a bitterish taste. It is somewhat soluble in water, and readily so in alcohol.

The hypnotic dose was found to be 2 to 3 Gm. (15 to 45 grains).

3. *Somnal*. This is also reported to be a chloral-urethane, but its composition is given as $C_7H_{11}Cl_2O_2N$, thus containing 2 more atoms of carbon and 4 more of hydrogen than chloral-urethane No. 1.

This is a liquid, clear and colorless, easily soluble in water and alcohol, according to Gehe & Co., who quote it in their price-list at 3.75 marks per 100 Gm. According to the *Chem. and Drugg.* it "has a melting-point of 40° C.," which would imply that it is a solid at ordinary temperatures. We have not seen it yet, and cannot say which is correct. The hypnotic dose is stated to be 2 to 6 Gm. (30 to 90 grains).

All of these new hypnotics are quite expensive as yet, and not sufficiently tried to justify their promiscuous use. If "chloral-urethane," without further specification, were ordered, we would dispense No. 1, as this seems to be known under no other name.

No. 2,387.—Tincture of Nux Vomica (J. M. D.).

A dispute has arisen between one of our subscribers and a physician regarding what should be the proper tint or color of tincture of nux vomica prepared in accordance with the U. S. Pharm. of 1880.

Evidently one of the gentlemen interested had been accustomed to the comparatively pale color of the tincture as made, in accordance with the previous Pharmacopœia, by percolation of alcohol through the powdered seed. This always yielded a pale tincture, about the tint of pale sherry, and sometimes even lighter. The U. S. Ph. of 1880 directs the tincture to be made from the extract, so that the product will contain 2 per cent of the dry extract. Now, in preparing an extract of nux vomica, much more soluble matter including coloring matter (but not necessarily more active constituents) is taken out of the seed than is done when making a tincture by percolation. Hence by dissolving the directed quantity of *extract* in alcohol, the tint of the resulting tincture is very much darker than that of the tincture prepared by direct percolation. Besides, while both the tincture and the extract of nux vomica of the U. S. Ph. of 1870 were prepared by means of strong alcohol, the menstruum directed by the Pharm. of 1880 consists of 8 parts of alcohol and 1 part of water. Such a menstruum dissolves much more of the "extractive" and coloring matter than strong alcohol. It is difficult to describe a color without having a definite standard to refer to. But the tincture which we make according to the U. S. Ph. of 1880 has about the same depth of color as old port wine, and the tint is reddish-brown.

No. 2,388.—Hair Tonic (M.).

The popular notion of a hair tonic is this: that the preparation will prevent hair from falling out, make hair grow faster, and even cause hair to grow on bald spots of the scalp. In many cases there is, indeed, some benefit derived from the use of judiciously selected preparations, but when the vitality of the follicles is once destroyed there is no remedy which will restore it. When the skin is very dry and the scalp not kept clean, hair will often break off close to the scalp, and this may lead to the supposition that the hair is "falling out." Whenever the hair of the head has a tendency to become "dry" and brittle, and when the scalp feels hot and dry, the application of a preparation like the following will often be beneficial:

Castor Oil.....	24	fl. oz.
Alcohol.....	96	"
Tincture of Cantharides.....	2	"
Borax.....	1	tr. oz.
Water.....	4	fl. oz.
Oil of Lavender.....	1	"
" " Bergamot.....	1	"
" " Cloves.....	1	"

Dissolve the oils in the alcohol, add the tincture and the castor oil. Dissolve the borax in the water by the aid of heat, and gradually add it to the other liquid, shaking well after each addition.

Some add a small quantity of quinine. If this is desired, it is best to use the oleate of quinine in such proportion that each fluidounce contains about 20 grains of quinine.

If desired, the preparation may be colored slightly by caramel.

No. 2,889.—Wine of Coca (W. S. M.).

The National Formulary—which you do not seem to possess as yet, but which you will find of great service—

contains a very good formula for this preparation. It is, briefly, as follows:

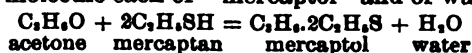
Dissolve 1 troy ounce of sugar in 10 fluidounces of claret wine, add 1 fluidounce of alcohol and 1 fluidounce of fluid extract of coca (U. S. Ph.), and then add enough claret wine to make 16 fluidounces. Let the mixture stand a few days, if convenient, in a cool place, then filter, and pass enough claret wine through the filter to restore the original volume.

No. 2,390.—Sulphonal and its Congeners (Albany).

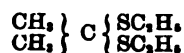
The pharmaceutical management of sulphonal is somewhat difficult, since it is so little soluble in water. If it is dissolved with the intervention of an alcoholic vehicle, it is more or less precipitated when it comes in contact with the contents of the stomach. It has been shown by Kast and many others that the hypnotic effect of sulphonal is greatly accelerated by giving it in such a form that it will be quickly absorbed. For this purpose, it may be administered in warm tea, or soup, or mulled wine, about an hour or two before bedtime. If it is given in substance, it will usually become so slowly dissolved that the hypnotic effect is either feeble or almost wanting, since it appears to be eliminated quite rapidly. In its passage through the organism it appears to be completely, or almost completely, decomposed, since sulphonal is found in the urine only under certain circumstances—for instance, when given in dilute solution. Incidentally we may remark that there is no reaction known by which sulphonal can be definitely detected. It is one of the most obstinate organic compounds known, resisting strong acids and alkalis, even bromine and chlorine. By fusion with alkalis, certain reactions may be produced, but these it shares in common with a whole class of bodies.

The derivation of sulphonal from alcohol, C_2H_5OH , may be explained in the following manner:

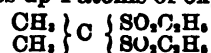
By treating alcohol with sulphuric acid, sulphethylic acid is produced. On distilling the sodium salt of this acid with a strong solution of sulphide of potassium, the principal product obtained is C_2H_5SNa (sodium mercaptide), which, by treatment with benzol and dilute sulphuric acid, is converted into the sulphur alcohol of ethyl, C_2H_5SH , usually known as mercaptan. This has a most disgusting and penetrating odor. On treating 2 molecules of mercaptan with 1 molecule of acetone, there is produced 1 molecule each of "mercaptol" and of water.



The chemical constitution of mercaptol may be more perspicuously explained by the following diagram, in which the central carbon atom, together with the 2 molecules of methyl (CH_3), are the residue of the acetone molecule, while the 2 molecules C_2H_5S are derived from the mercaptan:



Now, when mercaptol is oxidized—for instance, by permanganate—it takes up 4 atoms of oxygen, and becomes



and this is *sulphonal*, or "diethyl-sulphon-dimethyl-methane."

It will be seen that two of the affinities of the central carbon atom are satisfied by 2 atoms of methyl, and the other two affinities by 2 molecules of the group SO_2 , each in combination with an atom of ethyl. We may be permitted, at least provisionally, to regard sulphonal as being composed of the quadrivalent group



in which one pair of bonds is saturated or satisfied by methyl, and the other pair by ethyl.

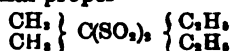
Recently the discoverer of the therapeutic action of sulphonal, Dr. A. Kast, in conjunction with Dr. E. Baumann, has studied a series of analogous compounds in which the several bonds of the group $C(SO_2)_2$ were saturated with various radicals of the fatty series, and very interesting and important results were obtained. The method by which these several compounds were obtained need not be given here. Among these substances, the following two deserve special mention:



Here we have three bonds saturated by ethyl and only one by methyl. The proper chemical name of this substance is "di-ethylsulphon-methylethyl-ethane," but the authors propose to call it for short *trional* (meaning that it is a sulphonal-like body, having three ethyl groups). And another:



This compound they name *tetronal*, since it contains four ethyl groups. To carry out the analogy, it might be suggested that sulphonal proper



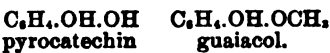
be called *dional*, as it only contains two ethyl groups.

Now, the two substances, trional and tetronal, have been found to be even more powerful hypnotics than the ordinary sulphonal, the most powerful being tetronal.

It is probable that one Or two of these bodies will shortly make its appearance on the market.
By varying the radicals, either derived from the fatty or from the aromatic series, a large number of combinations may be prepared, among which there may be found still more useful therapeutic agents than those above mentioned.

No. 2,391.—Creosote (J. M. S.).
The tests given by the U. S. Pharm. are sufficient to distinguish between genuine wood-tar creosote and carbolic acid. The latter has, unfortunately, been carried on the price lists of many manufacturing and wholesale houses as "coal-tar creosote," and it has been the custom, particularly among European Continental houses, to supply this (carbolic acid) when "creosote" without further specification was mentioned. Indeed, this is even now done by one of the most prominent makers of chemical products, to judge from the fact that his price list quotes three kinds of creosote: one, designated as "pure," made from beech-tar, and the other two, respectively as "pure, white, true," and "chemically pure, white, true," made from coal-tar. It is under all circumstances advisable, when ordering creosote from a dealer, to specify particularly either "U. S. Pharm." or "from beechwood tar." The sale of "coal-tar creosote" in place of the official article is, at the present time, almost criminal, since creosote is now being largely used in the treatment of phthisis, and often in doses which would be dangerous if phenol or carbolic acid were substituted for it.

The constituent upon which the special therapeutic effect of creosote depends—and which is utterly absent in carbolic acid—is *guaiacol*. This is the methylic ether of pyrocatechin:



It is, when pure, a colorless, oily liquid, highly refractive, of a peculiar aromatic odor, and having a spec. grav. of 1.1171 at 13° C. It boils at 201° C. [394° F.], is soluble in 200 parts of water, and is clearly miscible with alcohol, ether, or carbon disulphide. On adding a little ferric chloride to its alcoholic solution, the latter turns blue. A larger quantity of the reagent produces a green color. According to Merck's Bulletin (No. 8, from which we take some of these notes), 1 volume of guaiacol, when added to 2 volumes of petroleum benzin, produces a *turbid* mixture, which, however, becomes *clear* at 15° C. (59° F.) on adding 6 more volumes of benzin. One volume of guaiacol with 2 volumes of soda solution makes a *clear* mixture. This mixture is soluble in ten times its value of water to a clear and colorless liquid. On adding 2 volumes of solution of potassa [of about 15 per cent] to 1 volume of guaiacol, the mixture soon solidifies to a white, crystalline mass.

Among the formulæ recommended for its administration are the following:

℞ Guaiacol.....	gr. 15
Alcohol.....	℥. oz. 8
Tinct. Gentianæ.....	℥. oz. 1
	(Nobili.)

Dose: At first 5-15 drops after each meal, best taken in wine, broth, or sugared water. The dose may gradually be increased up to 30 and even 60 minims of the mixture per day.

Dr. Bourget recommends the remedy in larger doses. In summer, he gives it in vinous solution; in winter, in combination with cod-liver oil.

The summer mixture is as follows:

℞ Guaiacol.....	min. 120
Tinct. Cinchonæ.....	min. 360
Vini Malaccensis.....	℥. oz. 35

Dose: One tablespoonful at every meal in the beginning of the treatment. After a while, the dose is gradually increased up to 2-3 spoonfuls.

If not well borne by the mouth, the remedy may be administered by way of the rectum:

℞ Guaiacol.....	gr. 30
Ol. Amygdalæ.....	min. 360
Acaciæ.....	gr. 150
Aquæ dest.....	℥. oz. 32

Make into an emulsion. Administer one-fourth of this in one enema.

For the winter treatment the following mixture is recommended:

℞ Guaiacol.....	gr. 45
Ol. Morrhuæ.....	℥. oz. 8

Dose: One tablespoonful at each principal meal, and the following is to be applied, by inunction, to the chest, back, and armpits at bedtime, after which the patient should be well covered up to the throat:

℞ Creosoti.....	min. 800
Ol. Morrhuæ.....	℥. oz. 8

It is stated that creosote from beechwood tar contains between 60 and 90 per cent of guaiacol. If this is so, then it would certainly pay to prepare guaiacol from this source. But so far as is known, guaiac resin is still used as source, the process of preparation being the following:

Guaiac resin is subjected to dry distillation. The heavy oily distillate is dissolved in solution of potassa, diluted, and the volatile oils distilled off. The residue is not quite neutralized with sulphuric acid, the separated oil again dissolved with solution of potassa, and the mixture distilled in a retort. When the milky distillate becomes clear upon addition of a little potassa, it is decomposed by an acid, when crude guaiacol separates. This is dried on a water-bath over sulphuric acid. It is next subjected to fractional distillation, the portion boiling between 190° and 210° C. being received separately. This consists of guaiacol and cresol. To separate the latter, ammonia gas is conducted into the mixture, which converts it into a crystalline mass (only due to the guaiacol). This is quickly pressed, dissolved in a little warm ether, and mixed in a close vessel with alcoholic solution of potassa. The resulting crystalline mass is pressed, washed with ether, then decomposed with sulphuric acid, the oil separated, dried, and rectified.

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UEBER DIE VERBREITUNG CHEMISCHER VERBINDUNGEN IN DER PFLANZENWELT. Von ED. SCHAEER [of Zurich]. Reprint from the *Schweiz. Wochenschrift f. Pharmacie*.

AN able review and classification of the chemical compounds occurring in the vegetable kingdom, according to the various groups: alkaloids, acids of the fatty and of the aromatic series, phenols, quinones, ketones, ethereal oils, specific coloring matters, glucosides, bitter principles, etc.

PHARMACOGRAPHIA INDICA. A History of the Principal Drugs of Vegetable Origin met with in British India. By WILLIAM DYMCK, Brigade Surgeon Bombay Army, Principal Medical Storekeeper to Government; C. J. H. WARDEN, Surgeon Major Bengal Army, Professor of Chemistry in the Calcutta Medical College; and DAVID HOOPER, Quinologist to the Government of Madras, Ootacamund. Part I. 8vo. London and Bombay, 1889.

In our review of Prof. Dymock's "Vegetable Materia of Western India" (see *NEW REM.*, 1888, page 319), we already expressed our hope that the author would, at some future time,

publish a similar work comprising the vegetable drugs of the whole of British India, and we are now pleased to see that this has been undertaken. The task is so large that he has solicited and obtained the aid of two well-known experts, Prof. Warden and Mr. Hooper, and it is to be hoped that the work will be completed in a reasonable time.

The arrangement of the subject matter is by natural families, as in Prof. Dymock's previous work. In the first part, just issued, the medicinal plants belonging to the natural families from Ranunculaceæ to Burseraceæ (according to the system followed in the "Vegetable Materia Medica of Western India") are treated of. Under each plant name reference is made to any existing plates, then the habitat is given, next the vernacular names, the history and uses—in which connection much material is adduced from Oriental writers and other sources not generally accessible or consulted. An encyclopædia of this kind does not admit of being reviewed upon cursory reading. We shall watch its progress with eagerness and interest, and shall have occasion to refer to the contents hereafter.

The work has been printed at the Education Society's Press, Byculla, the resources of which are well known to us. We would strongly urge that the several parts as issued from the

press be left *uncut*, since the subsequent binding will reduce the margin of the work too much. Besides, some will probably wish to have the work interleaved.

HANDBOOK OF PHYSIOLOGY. By W. MORRANT BARKER, F.R.C.S., and VINCENT DORMER HARRIS, M.D. Twelfth Edition. Rearranged, Revised, and Rewritten, and with 500 Illustrations. New York: William Wood & Co., 1889. Pp. 784, 8vo.

THIS work, originally known as Kirke's, has so long been considered one of the most valuable text-books that no other remarks are needed beyond the statement that it has been revised to meet the changes which are requisite to bring it up to date.

A MANUAL OF DISEASES OF THE EAR, FOR THE USE OF STUDENTS AND PRACTITIONERS OF MEDICINE. By ALBERT H. BUCK, M.D., etc. New York: William Wood & Co., 1889. Pp. 420, 8vo.

THIS is an enlarged edition of the "Diagnosis and Treatment of Ear Diseases" which appeared in 1880, but has undergone such alteration as to be practically a new work. It is not often that a medical treatise exhibits such painstaking thoroughness regarding all its details, or leaves so little to be desired in the manner of treating the subject referred to.

American Druggist

Vol. XVIII. No. 12. NEW YORK, DECEMBER, 1889.

Whole No. 186.



THE COLLECTION AND PREPARATION OF CAOUTCHOUC.

An interesting description of the collection and preparation of caoutchouc is given by Franz Keller in his work entitled "The Amazon and Madeira Rivers," from which we take the following:

Near the Praia de Tamandua we acquainted ourselves with all the particulars respecting the collection and preparation of the caoutchouc, at the cottage of a Bolivian seringueiro, Don Domingo Leigne. The *Siphonia* grows, or at least thrives, only on a soil wherein its stem is annually submerged by the floods to the height of three feet or more. The best ground for it, therefore, is the igapó, the lowest and most recent deposit of the river; and there, in the immediate vicinity of the seringals, may be seen the low thatches of the gatherers' huts, wretched hovels mostly, rendered tenable during the inundations by the device of raising the floor on wooden piles of seven feet height, in which the canoe, the seringueiro's indispensable horse, also finds a protected harbor. Unenviable truly must be the life of the happy proprietor, who has nothing to do in the seringal during the wet season, and who then has ample leisure to calculate exactly the intervals between his

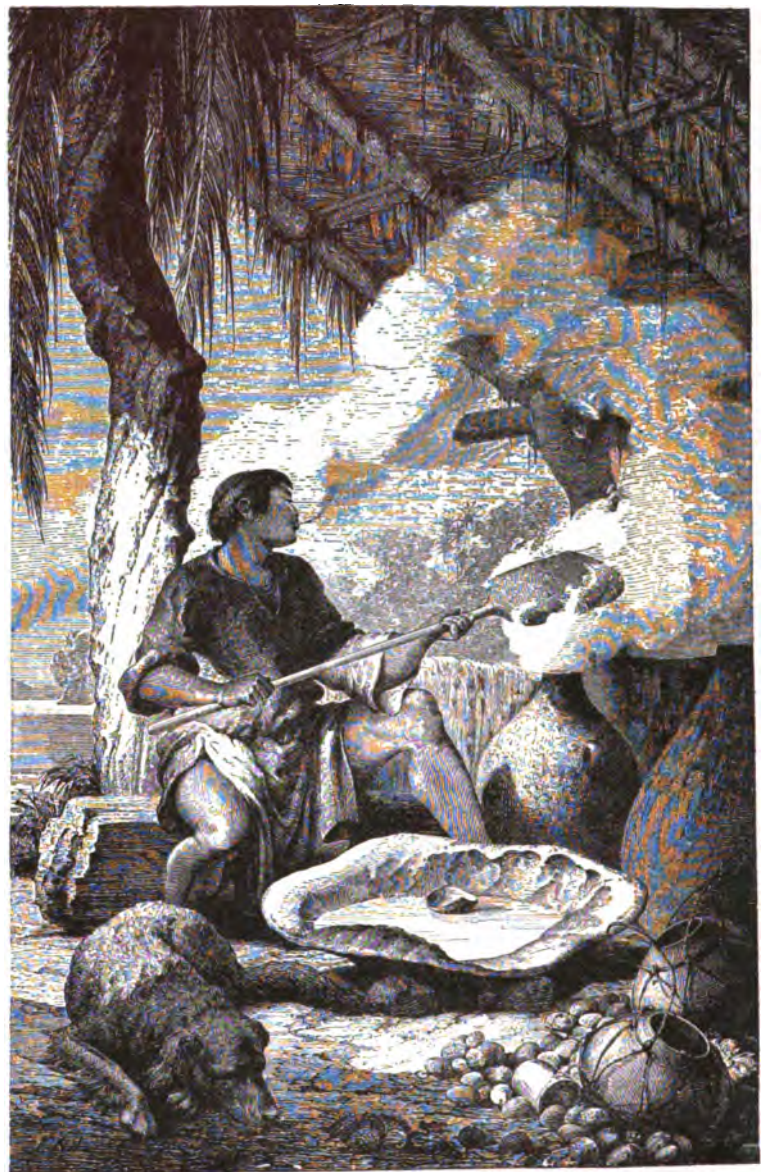
fits of ague, and to let himself be devoured by carapanás, piums, motúcas, and mucuims—under which euphonious names are known some of the most terrible of insect pests.

Narrow paths lead from the cottage, through the dense underwood, to each separate tree; and as soon as the dry season sets in, the inmate of the palace just described betakes himself with his hatchet into the seringal to cut little holes in the bark. The milk-white sap immediately begins to exude into pieces of bamboo tied below, over little clay cups set under the gashes to prevent its trickling down the bark. The collector travels thus from trunk to trunk; and to facilitate operations, on his return visit he pours the contents of the bamboos into a large calabash provided with liana straps, which he empties at home into one of those large turtle-shells so auxiliary to housekeeping in these regions, serving as they do for troughs, basins, etc.

Without any delay he sets about the smoking process, as the resinous parts will separate after a while, and the quality of the rubber so become inferior. An earthen jar, without bottom and with a narrow neck, is set by way of chimney over a fire of dry urucury, or nauassú palm nuts, whose smoke alone, strange to say, has the effect of instantly coagulating the caoutchouc sap, which, in this state, greatly resembles rich cow's milk. The workman, sitting beside this "chimney," through which roll dense clouds of a smothering white smoke, from a small calabash pours a little of the milk on a sort of a light wooden shovel, always careful, by proper management of the latter, to distribute it evenly over the surface. Thrusting the shovel into the thick smoke over the opening of the jar, he turns it several times to and fro with great rapidity, when the milk is seen to consolidate and to take a grayish-yellow tinge.

Thus he puts layer upon layer, until at last the caoutchouc on both sides of the wood has reached about an inch in thickness, when he thinks the "plancha" ready. Cutting it on one side, he takes it off the shovel and suspends it in the sun to dry, as there is always some water between the several layers, which should, if possible, evaporate. A good workman is thus able to prepare five or six lbs. of solid seringá in an hour. The plancha, from its initial color of a clear silver-gray, turns shortly into a yellow, and finally becomes the well-known dark brown of the rubber such as it is exported.

The more uniform, the denser and freer of



INDIA-RUBBER MANUFACTURE ON THE BANKS OF THE MADEIRA.

DESCRIPTION OF ILLUSTRATIONS.

INITIAL.—Group of cipós (lianas) encircling a little palm.

PREPARATION OF THE INDIA RUBBER.—The workman, a Mojos Indian, holding his wooden shovel, covered with a fresh layer of milk, in the white smoke which issues out of the chimney-like pots from a fire of urucury, or nauassú palm-nuts (which alone consolidates the milk in the proper way), sits in the midst of his simple utensils; the nuts on the ground, the calabashes, and a cup of bamboo in which he fetched the milk from the seringal, to pour it into the turtle-shell in the middle.

A SERINGUEIRO'S FIRST SETTLEMENT ON THE MADEIRA.—On the high shore, but in the immediate vicinity of the moist seringals (caoutchouc-tree woods), the first household arrangements are made. The richly embroidered hammock is extended between two trees, and a dense mosquito-net is spread over another, serving for the night, and shaded with a light roof. Immediately to the right is the kitchen, with a tartaruga (turtle), that most patient of all animals, which, simply laid on its back, helplessly and noiselessly awaits the fatal stroke. In the foreground the temporary wife of the owner, a young mestizo lady, with raven-black hair, comfortably smokes her cigar, rocking herself leisurely in the hammock.

HOUSE OF A RICH SERINGUEIRO.—In the middle the palm-leaf covered house; in the foreground, to the right, a group of the banana da terra (pacova), or indigenous plantain, a large bunch of whose yellow fruit an Indian is taking to the kitchen.

bubbles the whole mass is found to be, the better is its quality and the higher the price it fetches. Almost double the value is obtained for the first-rate article over that of the most inferior quality, the so-called seruamby or cabeça de negro (negro's head), which is nothing but the drops collected at the foot of the trees, with the remains of the milk scraped out of the bottoms of the calabashes. The rubber of India is said to be much like this seruamby, and, like it, to be mixed with sand and small pieces of bark. By way of testing the quality, every plancha is cut through again at Pará; by which means discovery is made, not only of the bubbles, but also of any adulteration that might be effected with the milk of the mangaba, that fine plant with dark glossy leaves, now found so often as house plants under the erroneous name of rubber-plant.

Native Indian Signboards.

A WRITER in the *Times of India* has been investigating the native quarters of one of the great Indian cities, for the purpose of making merry on the way in which native shopkeepers air their knowledge of the English language in the business announcements over their shops, and his peregrinations have been rewarded by a large crop of oddities. A Goanese trader announces on a very prominent signboard that "chiroots and cigarettes fresh fry mutton things will be got here," while a rival shopkeeper describes himself as a "tea puddin ice-cream bayeef orburning robe

What is an Adulteration in Pharmacy?*

BY J. U. LLOYD.

ON first thought, this query would appear to admit of but one answer, and that to the effect that the nature of an adulteration in theory can be easily determined. Upon the contrary, there are connected matters which in the State of Ohio reach into the subject, and some of our members may be interested in studying them in these directions. We do not need to be told that to mix water with alcohol, alcohol with sulphuric ether, sulphuric ether with chloroform, and so on, selling each as a full-strength preparation, is typical of adulteration. An imposition is then practised on the innocent purchaser, an intentional deception and debasement for the gain that results to the admixer.

Wherever we turn in the matter, whether it be in powders or liquids, the rule holds good and needs no further consideration from us, as the facts of intentional debasement of a substance for unearned gain are too well understood to demand explanation.

It is perhaps not so well known that persons of the utmost integrity may unconsciously and innocently adulterate in certain directions, in the eyes of the law; and unquestionably it will surprise many perfectly honorable persons to learn that technically they are now guilty of adulterating, and might perhaps legally be classed with intentional mixers for gain. Really, a deviation from a recognized



FIRST SETTLEMENT OF AN INDIA-RUBBER COLLECTOR (MADRAS).

aneer and retail seller." Yet another storekeeper intimates that he keeps in stock "profitable Benares conserve of the hog plum." Further on an announcement runs: "The shop No. 13 in the name of T. D. Veerjee, cloth merchant, conducted by T. Giga Nuthoo. No tricks shall be played even towards a boy or a man of common sense. In case if the cloth is returned, being unsuited, its value shall be paid back and terms cash." Hakim Syed is a "Rumlee Juffree and astrologer," and Essajee a "plumber dranpipe and drang builder in new system." The oddest announcements of all are those of persons connected with the medical profession or the drug trade—Mr. Dhodee Chundrojee, for instance, having appropriated the title of "oculi et auris chirwig"; and a board on a charitable dispensary announcing that the institution is "for poor only and oculist." A similar institution is the "Cheapest Medical Dispensary has been opened for the benefit of the persons of small sum, and poor salary." "Syed Khoja Kurindinsha Chisliti, generation of Syed Khoja Mohidin Chisti, inhabitant of Ajmere, now wishes to celebrate, which he has been offered from his master, to cure the patient demon, magic devils, etc., or any short of patient to whom doctors cannot cure the patient should attend here he will be cured by the favor of God." A certain other Syed calls attention to the fact that he "can cure every kind of disease particularly the seven kinds of fites, etc." A lady rejoicing in the name of Vurzeebeebie states her calling as a "nurse medicine of any sickness for man and womans, and bone settler." A native chemist's signboard runs as under: "Nuthoo Ramjee, candee shop is very good and cheap medicine to be had at any time."

standard, regardless of the selling or cost price of the preparation, may constitute an adulteration. The selling, under the pharmacopœial name, of a substance differing from that of the Pharmacopœia, regardless of the expense to the maker, is, in Ohio, made by special definition an adulteration; and what prominent manufacturer does not send products to this State?

ADULTERATION LAW OF OHIO.

SEC. 2. The term "drug," as used in this act, shall include all medicines for external or internal use, antiseptics, disinfectants, and cosmetics. The term "food," as used herein, shall include all articles used for food or drink by man, whether simple, mixed, or compound.

SEC. 3. An article shall be deemed to be adulterated within the meaning of this act:

(a) In the case of drugs: (1) If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality, or purity laid down therein; (2) if, when sold under or by a name not recognized by the United States Pharmacopœia, but which is found in some other pharmacopœia, or other standard work on materia medica, it differs materially from the standard of strength, quality, or purity laid down in such work; (3) if its strength, quality, or purity falls below the professed standard under which it is sold.

* Written by request of Mr. A. Robinson McIlvaine, chairman of the Committee of Adulteration and Sophistication, National Wholesale Drug Association, 1899. Read at the annual meeting at Indianapolis, October 22d.

This, therefore, brings jobbers and wholesale manufacturers nearer to the U. S. P. than they had perhaps heretofore supposed themselves; in Ohio, at least, it is by law made the standard that all dealers in medicine must bow before. Every ten years the U. S. P. is revised, and with each revision, in order to avoid becoming criminals in the eyes of the law, those who now sell their manufactures in Ohio, as plainly stated in our adulteration law, must, as I see the subject, discard their old stocks and make their processes for official preparations conform to the U. S. P., if they name them by the official title.

This law goes further: not only are we compelled to conform to the U. S. P. standard, but we cannot use the U. S. P. title qualified by explanations so as to show that a preparation of other strength is represented. For example, we cannot use the term "fluid extract of arnica" on a preparation of different nature or strength than the official, even though we explain on the label that this is *not* U. S. P. Neither, as I see the matter, can we use any U. S. P. title for a similar preparation that is named in a foreign pharmacopoeia, even if we should distinctly state this fact. For example, the statutes of Ohio actually forbid us making and selling *infusion of digitalis*, *Pharm. Germ.*, because the U. S. P. recognizes infusion of digitalis of a different strength (see Ohio law, section 3, a (1).)

However just this ruling may generally be in one sense, it appears in other directions oppressive. Take, for example, a drug introduced originally by a certain manufac-

It is well known that the U. S. P. is not an originator but a follower. Irregular preparations come into demand through individual exertion; physicians prescribe certain of them, and at last the committee of the U. S. P. recognizes their importance. A process is adopted for making them, and thus, although the official product may be in many respects dissimilar from the original preparation, it is legally established as the standard.

This is not all of the problem with which we have to contend in the matter of deviation officially, for subsequent revisions of the U. S. P. may materially alter the formulæ of those preceding (indeed, the most do so), and this necessitates a periodic disturbance of the manufacturers' business. A more sensitive barometer than the change in appearance of a medicine can scarcely be suggested, and all persons connected with manufacturing interests realize that the necessary changes that are made in the formulæ and methods of the U. S. P. tend naturally to create more than a little disturbance in the manufacturers' field.* The apothecary, with his limited personal trade, can easily explain these differences to his patrons, the change from old to new is usually easily accomplished with him; but the customers of a manufacturer are scattered over the entire country, and only manufacturers realize the aggravations that follow the disturbances of this nature. It seems just, therefore, that a period of time should be established whereby old stocks may be exhausted, in order to permit products of the old process to be exhausted and changes familiarized before compelling



HOUSE OF A WEALTHY INDIA-RUBBER COLLECTOR (LOWER MADRIRA),

turer, in fluid-extract form, to oblige a physician who is the only person using it. The physician commends it to his professional friends; the manufacturers finally advertise it extensively. A general demand arises, and it becomes of sufficient interest to be made official. The committee of revision of the U. S. P. then recognizes the necessity for a similar article, and adopts a menstruum that is different from that employed in the preparation that made the demand (the official may actually be inferior from inexperience of the committee with this one drug). It becomes official, but as it is established by the U. S. P. is a very different substance from the liquid that gave the reputation to the drug. Physicians who formerly employed it may even object to the new (official) preparation, which in reality is designed as a substitute for the genuine, and demand the original; and yet this genuine has really become an adulteration, in the eyes of the law, and cannot be sold under the general name in Ohio. The original maker and introducer must disturb his business, alter his process, and perhaps enter into a world of explanations to complaining patrons, if he drop the original formula and recognize the U. S. P. process, as he should do if possible. If he does not do this, he is guilty of adulteration, according to my construction of the laws of Ohio, and would possibly be held for irregularity elsewhere if accident followed.

That this simile as regards change in product is not overdrawn is evident from the continued experience of various manufacturers of pharmaceutical preparations in this direction, who, however, probably believe that, unless their preparations are labelled U. S. P., they have a right to deviate from the standard established by that work.

us to replace with the new. This may perhaps properly be done by amendments to the law of this and perhaps other States, or even, if necessary, by a clause in the U. S. P. establishing the date at which the new revision shall go into legal and permanent effect in order to meet such cases as the one under consideration.†

In this connection, the question arises, Can the U. S. P. control the names of substances introduced by an individual or a firm, or that have been evolved by a long series of years in commercial affairs, and affix those names to different materials, and thus cast the odium of adulteration upon the original preparation?‡ That excellent authorities have maintained their right to personal methods, in which products under the official appellation differ from the official, is evident, and some do so yet. When the U. S. P. appeared in 1870, no less an authority than Dr. Squibb§ rebelled against many of its prepara-

* Do not infer that this is an adverse criticism of the U. S. P. Upon the contrary, all persons recognize the necessity of these ten-year alterations in that work, and I consider this publication, especially its last issue, as an upward evolution in a work that we may take pride in praising.

† Credit for this opinion should be extended an able reviewer of this paper, whose name I do not feel at liberty to divulge, but whose judgment I would unhesitatingly accept in all matters connected with the subject under consideration.

‡ The U. S. P. committee, as I view the matter, have never absorbed a private proprietary name; at least I have no knowledge of such act. Strictly scientific appellations are used with all preparations in that work, or at least names explanatory of the substance designated. Manufacturers and others who have established fanciful names, and created a personal demand for preparations under such ownership titles, will probably support this view. I doubt if any man has cause to criticise the work in this direction, or if any firm can view the course of the U. S. P. committee in other than admiration at their respect for the rights of individuals.

§ I do not hesitate to assume that this unimpeachable authority uses the term U. S. P. only when a preparation is made in exact conformity with that

tions. To use his words respecting the fluid extracts of U. S. P. 1870:—*

"They have not only substituted glycerin for the sugar in the 10 old fluid extracts which contained sugar, but have introduced it into 7 of the remaining 14 old fluid extracts after ten years' experience had proved it unnecessary, leaving now only 7 of the original 24 without it. Then the committee introduce 22 new fluid extracts, 17 of which contain glycerin, thus making a total of 46, of which the large proportion of 34 contain glycerin. This new official feature will not probably be generally followed, and should not, and the Pharmacopœia will have to be satisfied with that degree of loyalty which adopts its now uniform strength for fluid extracts, whereby each minim represents a grain of the drug from which it is made."

It is now nearly twenty years since that day, and there has been a continuous trend towards centralization in State laws that govern druggists. What was possible then is impracticable now. The privileges of the individual have been circumscribed, and in business matters we, as individuals, must bow to modern laws passed avowedly in the interest of the multitude. To take the stand that Dr. Squibb held then would now be an act of open defiance of the statutes of the State of Ohio, should the subject come to issue, and possibly of other States. I, for one, agree with him concerning the justice of his decision at that time. I believe that his studious experience as a manufacturer was such as to justify him in protesting openly against the glycerin craze of the pharmacopœial committee of 1870. Subsequent revisions of the U. S. P. show that he was right, and yet, as I see the matter now, we defy the positive wording of the law at this day if we use our individual experiences and replace a U. S. P. formula with a better one, or retain an original process in the face of one official, if we sell our products in Ohio under the official name, even if we should distinctly state that this is not U. S. P.

It may occur to some persons to argue that if real improvement of product results from such individual labor, there could be no objection to a deviation in that direction, and that the improved substance could not be adversely decided against. Upon the contrary, if the U. S. P. process yields a defective preparation, this preparation establishes its dose and use in therapy, and to substitute an irregular, stronger one might really, with some drugs, prove a serious matter. If it could be shown that the U. S. P. preparation was the legal one (as our Ohio statutes establish it) and would have been harmless, it is possible that in case of toxic action the dispenser or maker of a more energetic one who uses the official name simply (without the U. S. P.) would be held responsible for its action, even without a positive statute such as we have in Ohio.†

From a consideration of this subject I am led to accept that a deliberate alteration of a pharmacopœial preparation, if the preparation be sold in Ohio under the official title, is an adulteration in pharmacy, regardless of the value or the cost of the material, and I do not know but that law would support it elsewhere. Even if the maker is actuated by the highest motives and produces a better preparation than the official, selling it even at a loss in money to himself, the use of the official name makes (he need not say U. S. P. on the label) it an irregular preparation.‡

I am quite sure that many manufacturers do not realize their responsibilities in these directions. We have generally considered in trade that adulteration is practised only for unfair purposes, and many have accepted that it must always be an act intended to cheapen a substance. Those who make pharmacopœial preparations may, however, it seems to me, rest assured that the money value of a preparation is not a consideration in this law; that the maker of a double strength "tincture of opium," sold under that name, is responsible alike with the one who makes the half strength—indeed, that the former act might become more serious than the latter.

Owing to the fact that many members of this Society are now engaged in manufacturing fluid extracts and other preparations on a large scale, that the jobber is rapidly becoming a producer and not a mere handler. I take the liberty to present this paper, feeling that the ideas suggested may be kindly received and of value to some of our members.

publication, and that any preparation bearing his label is unquestionably as represented. However, Dr. Squibb, in 1873, maintained his right to a certain amount of liberty which, if exercised now, would, by the inflexible definition of the Ohio Adulteration Law, place him among persons who deface their products for gain. Be it said for Dr. Squibb that he has no proprietary preparations and no private processes, and I think facts are stated beyond contradiction. For this reason, perhaps, he is in a better position to maintain his stand than some of us, who maintain an ownership right in methods and processes earned by labor, thought, and expense—a right of property that I, for one, maintain is just and a birthright.

* New York Medical Journal, April, 1873.

† The late Professor W. B. Chapman, when a judge at the Cincinnati Industrial Exposition, informed the writer that he would decide more forcibly against toxic preparations made stronger than the U. S. P. required than against those weaker, upon the ground that injury from overdose was a more serious matter than underdosing.

‡ The query arises, "Can the preparation of a drug be adulterated with another portion of itself, thereby intensifying its action instead of debasing? According to the Ohio laws, which give a special definition, if any preparation deviates from the standard of the U. S. P. it is adulterated. The definition of the word adulterate in our dictionaries seems to me, however, to refer to a debased material.

In addition thereto I would suggest that, as manufacturers of official preparations and of irregular preparations that are about to become official, perhaps through our energies, we should, whenever possible, lend a helping hand to the revisers of the Pharmacopœia. Our experiences in many directions are far greater than those of any member of the committee of revision of the Pharmacopœia, and I speak advisedly when I say that our aid will often be thankfully received by these gentlemen, and, I believe, will surely deflect immature processes when special preparations, that we are from large experience expert in making, earn such positions in the eyes of the country as to demand their official recognition. Our co-operation may also serve in introducing, at the start, formulæ of such perfection as to permit them to remain unchanged from decade to decade as the work is revised.

As a partial answer, then, to "What is an adulteration in pharmacy?" I reply, in the eyes of the laws of my State, a deviation from the standard established by the Pharmacopœia of the United States will probably come under that head if the preparation be sold under the pharmacopœial title, regardless of the strength, value, cost, or selling price, and irrespective of dictionary definition of the word adulterate. That this may seem a harsh ruling to many who have devised special processes and an extensive trade for preparations that in a very different condition subsequently become official, cannot be more apparent to, or bear harder on, others of this Association than on the writer, to whom has been awarded the subject of which this communication is a partial answer.§

Separate Estimation of Strychnine and Brucine in Nux Vomica.

At the late meeting of the German Naturalists and Physicians at Heidelberg, Prof. H. Beckurts read a paper on a method for separately determining strychnine and brucine in nux vomica. The following abstract is from the *Chem. Centralblatt*:

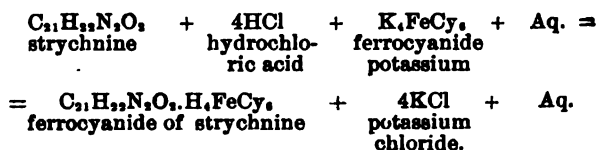
The author had already previously pointed out a method for separating strychnine and brucine, which consisted in precipitating the former, in a solution acidulated with hydrochloric acid, as ferrocyanide ($C_{12}H_{11}N_3O_8 \cdot H_2FeCy_6$), the corresponding brucine solution being soluble. The determination may be conducted volumetrically, and the results are satisfactory. Kremel has examined this method, and has likewise declared it satisfactory. But he reports having found in an extract 7.3 per cent of strychnine and 14.28 per cent of brucine, which proportions do not agree with the results obtained by the author. The latter therefore requested Mr. Holst to investigate this point. The alkaloids were separated in the usual manner by shaking with chloroform, the residue converted into salts by adding a sufficient but measured quantity of $\frac{1}{10}$ normal hydrochloric acid, and the excess of acid determined by titration with $\frac{1}{10}$ normal alkali. This gave the total alkaloids. They were, however, not pure enough to serve for the final treatment with ferrocyanide. Hence the solution was again evaporated with addition of ammonia, the residue extracted with alcohol, this solution again evaporated, and finally extracted with chloroform. The latter having been evaporated, the total quantity of alkaloids was determined as before; next the liquid was acidulated with hydrochloric acid and precipitated with a volumetric solution of ferrocyanide.

This method, then, permits the determination of the total alkaloids (strychnine and brucine). Moreover, by its use, the relation of the alkaloids in the nux vomica, or extract, is not altered by it. In five extracts this relation varied as follows:

Amount of strychnine 42 to 54 per cent.
" " brucine 58 to 46 per cent.

Note by Ed. Am. Drugg.—The volumetric solution of ferrocyanide of potassium spoken of above is to be prepared (according to Beckurts) by dissolving 10 Gm. of the salt in distilled water to make 1 liter. Since the reaction which takes place between this salt and the strychnine is in the proportion of 422 parts of ferrocyanide of potassium to 334 of strychnine, it follows that each cubic centimeter of the above-mentioned volumetric solution, which contains 0.01 Gm. of ferrocyanide, corresponds to 0.0079147 Gm. of strychnine.

The reaction is as follows:



§ In my opinion, it would neither be expected by the profession of medicine nor desired by the revision committee that methods of manipulation that give a manufacturer's wares a deserved superiority over that of a competitor should be divulged to his injury. My views of this problem are too plainly recorded to permit of such a construction. Liberality in a general sense tends to advance the interests of all concerned, and, it seems to me now as it has heretofore, can often be exhibited on the part of those of our members who do not depend on specialties only, with benefit rather than injury to themselves. Some of our members may think that the jobber and the United States Pharmacopœia are out of sight of each other. I believe that men who select and distribute all the drugs for this nation are interested in the standard of the nation.

PHARMACEUTICAL MACHINES.

THE correspondent of the *Chemist and Druggist* describes a number of appliances, exhibited at the Paris Exhibition, of use to pharmacists, some of which are mentioned below. They are chiefly adapted to manufacturing on a large scale, but are of general interest.

POWDERING MACHINE.

Beyer Bros., 16 and 18 Rue de Lorraine, Paris, showed a triturating machine, to be driven by hand or steam, costing in the neighborhood of \$200, and shown in the adjoining figure. The cams not only raise the pestles, but may cause them to revolve, and the escape of the drug during the operation is prevented by the rubber jacket shown on the left of the two mortars. It is said that a large number of these machines are already in use in Parisian laboratories for the production of impalpable powders.

PILL-PRINTING MACHINE.

H. Nègre & Co., 57 Avenue du Main, and Patau, 43 Avenue du Main, Paris, make a machine for printing on pills which is about the size of a Morse telegraphic apparatus. The coated pills to be printed on are placed in the hopper, and from there pass through grooves which bring them under the printing rollers near the discharge spouts. The printing is done with ordinary printer's ink, and the impression may give the name of the maker, the name of the pill, or an abbreviated formula, as may be desired. This seems to be an improvement upon Vial's machine, described by us some years ago, in that it prints more pills in the same space of time.

PILL-MAKING MACHINE.

Nègre & Co. also show a machine alleged to be capable of turning out 125 pounds of pills daily, and shown in the adjoining figure; but no description accompanies it, and the correspondent remarks upon the difficulty with which information was obtained from French exhibitors respecting the working of their machines.

WEIGHING AND PACKING MACHINE.

Avery & Clauston's weighing and packing machine for powders, seeds, etc., is capable of weighing and filling many hundreds of packages per hour. The powder, or whatever it may be, is carried into the hopper, and from this it falls into the package below, so that, when the desired weight has gone in, the balance turns, and at the same time a long-arm lever brings a disc into the mouth of the hopper, which effectually closes it. Machines of this kind are now extensively used, and are made so that they can be worked by steam power, every part of the operation to the bringing-up of the packages being done by mechanism. In the one illustrated there is a combination of three packet-holders, each one of which affects the balance only when under the hopper.

Supplement to the German Pharmacopœia.—The *Apotheker Verein* has resolved to undertake the publication of a supplement to the new Pharmacopœia, which will be edited by Dr. Vulpius, and which will correspond somewhat with the "National Formulary" of unofficial preparations of the American Pharmaceutical Association. It will contain particulars of all the latest chemicals and preparations of vegetable origin. The profits arising out of its publication are to be handed to the relatives of the recently deceased chemist, Schlickum, whose services in connection with the Pharmacopœia will thus be appropriately recognized.—*Chem. and Drugg.*

Examination and Preservation of Medical and Surgical Appliances.

C. SACK, of Berlin, gives some very practical directions for the management of this important class of druggists' sundries, which we copy from the *Monthly Magazine*:

Air and water cushions ought not to be stored in a folded state. The temperature of the room in which they are kept ought to be moderate, not too cold, as the rubber is spoiled by prolonged exposure to cold; the same is done by contact with fatty oil, such as carbolic oil, etc. Small rents in the cushions can be mended. A complete air- and water-tight cushion ought to bear the following test. The cushion in the insufflated state is gradually charged with a heavy weight, which has been placed on a flat board. The weight ought to be in proportion to the size of the cushion, 150 lbs. being sufficient for a cushion of the size of a square foot. The cushion may be declared in order if, after twenty-four hours' pressure, no air has escaped.

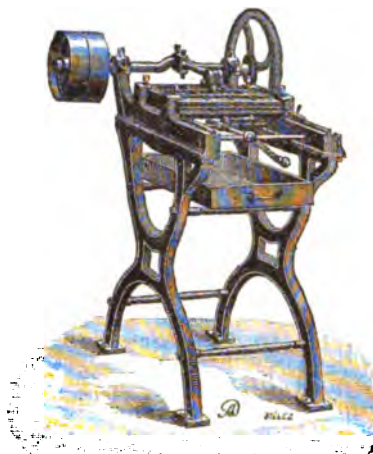
Brushes are best kept in tin boxes with tightly-fitting cover; spoiling by moths, etc., is prevented by having a piece of camphor or naphthalin in each box. Originally, all brushes used for surgical purposes, eye, throat, and wound brushes, were made of American fish-hair. But as the latter has risen enormously in price, the manufacturers began to substitute for it the much inferior hair of cats, foxes, bears, etc. So cleverly is the imitation made

that even competent eyes are deceived, and that only microscopic examination is able to disclose the deception.

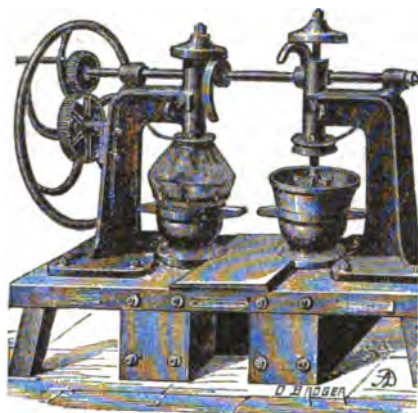
Ice bags are often leaking because they are not treated sufficiently carefully by the public. The ice ought to be crushed into small pieces before filling the bag, to prevent cutting by their sharp edges; the pieces may also previously be dipped into warm water, which will melt away the edges. Customers sometimes complain of leakage of an ice bag, when the moisture observed on its outside is only caused by condensation of water vapors from the surface of the body. Ice bags, before sold, ought to be tested as to their tightness. This is done by insufflating the bag, closing it firmly, and pressing on it from the outside, when the finest leakage will be discoverable by



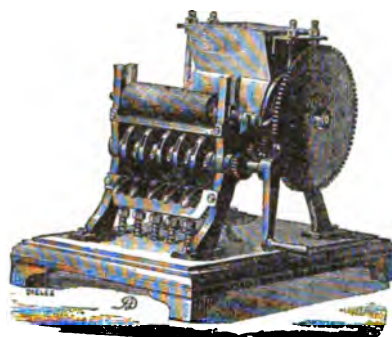
Weighing and Packing Machine.



Pill-making Machine.



Powdering Machine.



Pill-printing Machine.

the noise with which the air escapes.

India-rubber goods form a very prominent article in the chemist's shop, and as good appearance and quality depend much on the way in which they are kept, every chemist ought to be well acquainted with the peculiarities and properties of such goods. There are two principal kinds of rubber—hard india-rubber, commonly called vulcanite, and soft india-rubber, of gray, brown, or black color. The former is very durable, whilst the latter is easily spoiled by unsuitable treatment. Soft india-rubber, forming the material for mackintoshes, air and water-cushions, tubing, etc., is regularly adulterated by a smaller or larger quantity of the substitutes for india-rubber. By such admixtures the articles are, of course, made cheaper, but at the expense of elasticity and durability. Superior material, so-called moss rubber, is perfectly free of them, and may be recognized by putting it into water. It will swim in the latter if it consists of genuine moss rubber. Soft india-rubber ought to be kept at a moderate temperature, never below 25°; it becomes hard, brittle, and permanently unfit for use by cold, as likewise by storing it for a certain period, which varies according to the quality of the goods. Superior articles become hard only by keeping for several years. Patent india-rubber may be of black, brown, or gray color, the first two kinds indicating greater elasticity and durability than the latter. Patent india-rubber which, in consequence of long-continued storing, has lost its original lustre, may be restored by rubbing it with some

glycerin. It may be distinguished from the inferior Pará india-rubber by concentric rings, which will appear when the material is drawn into long, thin streaks. The black variety of patent india-rubber is more durable than the red. Pessaries and syringes made of Pará rubber, covered with a very thin layer of patent rubber, are sometimes sold as genuine patent rubber goods. The fraud can only be discovered on tearing the articles into pieces. Newly made patent rubber goods ought not to be exposed to great pressure, as this rubber is sometimes affected by too close packing. They frequently possess a strong odor, caused by sulphurous acid gas, which will disappear rapidly by keeping the articles in the open air. Fresh hollow articles, such as balloons, cushions, etc., have to be inflated and emptied repeatedly before the odor disappears. Other delicate articles, on which sulphurous acid gas might have an effect, ought to be kept away from patent rubber goods. Handsprays with silk nets, urinals with bandages, and all other articles which consist partly of rubber and partly of tissue, ought to be kept in an imperfectly closed box, as otherwise the evaporating sulphurous acid gas might destroy the tissue, the gas becoming oxidized into sulphuric acid. The articles may also suffer by contact with fats and oils, or by exposure to sunlight.

Inhalation apparatus ought to be turned on to a full flame, as otherwise they frequently fail to act with sufficient power. Stoppages in the two inhalation tubes may readily be removed by blowing through them in the reverse direction. If the tubes and points are not stopped, and the latter are placed very near each other, the apparatus ought to be in good working order. The intact state of the tubes may be proved by detaching them from the apparatus and blowing violently through one tube whilst the other is immersed in water.

Dressing material, especially absorbent cotton wool, derives its value from the white color, from the power of absorption, and from the length of the fibres of the tissue. Absorbent cotton wool with the longest fibres is the most valuable dressing material for surgical purposes. Short-fibred may be distinguished from long-fibred cotton wool by the loose, not compact texture, by being mixed with remnants and waste, and by yielding much dust when shaken. The quality of other dressing material, such as gauze, cambric, etc., is better judged according to the arrangement and number of threads. The price varies accordingly. The threads are counted in a square piece of a certain constant size, and by comparing the number with the one obtained in other cases, judgment of its quality may be arrived at. Gauze bandages vary in value also according to their weight, but the valuation by this method is deceitful in cases where the bandage is impregnated with starch and other chemicals. Dressing material containing iodoform, salicylic acid, carbolic acid, etc., ought from time to time to be controlled with regard to their pretended percentage of chemicals. With iodoform gauze the size of the meshes has also to be taken into consideration; as, for instance, a 20-per cent gauze of wide meshes may contain less iodoform than a 10-per cent gauze of small meshes.

Plaster of Paris bandages ought to be well guarded against cold and damp. If kept in suitable well-closed boxes, they remain perfectly serviceable for at least two years. In using them they must be immersed in warm water for at least two minutes before application.

Tubing may be judged according to color, gray tubing being the most inferior, which may be mixed up with anything but real rubber. Superior tubing, as used for irrigators, clystomopes, sprays, etc., ought not to give way on being stretched from a length of 10 inches to 35 inches. By lifting with it a weight of 60 pounds the tubing ought not to be torn. Cracks are avoided by keeping it in wide circular curves.

Solution of Citrate of Magnesium, and a Proposition for Revision of the Official Formula.*

BY LUTHER F. STEVENS, BROOKLYN, N. Y.

EVERY one acquainted with pharmacy knows that there is difficulty with the present official process for the medicament above named. The situation is such as only to need the statement without proof, while the consequence has followed that, though many calls for more accurate construction have arisen, the ancient methods still have been copied without change, until every maker, whether small or large in his output, has a private recipe which is thought to work better; and, as an actual industrial fact, this is usually the case. It seems strange that, with this unsatisfactory position in which the whole trade is placed, no one of requisite skill and name to carry weight has cared sufficiently for the cause to probe the matter throughout and disclose not only the reasons of failure, but also a simpler and better way. Some such considerations have led to thought and work such as time could be spared for, and finally to the production of this paper and the experiments and samples spread upon the tables before you by which to prove the various steps.

I speak to-day for the hydro- or acid citrate, or sometimes called bi-basic citrate, stated thus: $\text{MgHC}_2\text{H}_3\text{O}_7 = 214$ when anhydrous, holding still one basic hydrogen which gives it its name and also its medicinal activity, this and one basic Mg attached to the citrate group, minus the water of crystallization contained in the citric acid, and two replaceable hydrogens displaced by dyad Mg.

In a molecular statement, official magnesium carbonate aggregates to the rating 484, this bearing 5 Mg, which require 5 citrate molecules, one being contained in each 210 of citric acid.

$4(\text{MgCO}_3)\text{Mg}(\text{OH})_2 \cdot 5\text{H}_2\text{O} = 484 + 5(\text{H}_2\text{C}_2\text{H}_3\text{O}_7 \cdot \text{H}_2\text{O}) = 1050 = 5\text{MgHC}_2\text{H}_3\text{O}_7 = 1070$ (when not crystallized) $+ 4\text{CO}_2 = 176 + 16\text{H}_2\text{O} = 288$ (10H₂O from water of crystallization in the materials, and 6H₂O from 6 free O and 12 free H, consequent from the decomposition). Also this salt will always form when citric acid is in excess of above proportion, leaving some free acid, while predominance of Mg, in whatever form held, will produce more or less of the neutral or sesqui or tri-basic salt, $3\text{Mg}_2\text{C}_2\text{H}_3\text{O}_7 = 450$ rated as anhydrous, or 630 when crystallized. For instance, a solution made containing 23.37 of anhydrous acid salt, to which 10.47 Mg. Carb. (official U. S. P.) is added, will in a few days bring the acid salt to 25 of sesqui salt.

The present U. S. P. formula, we all know, produces both of these salts—the sesqui in preponderance—to the waste of good chemicals and great loss in therapeutic effect, while if the 200 grains of carbonate were worked up into this acid salt the result would be 442 grains (anhydrous)—much too great a dose for the purposes and cases in which this inimitable medicament is used.

These matters lead me to the *proposition for revision*.

I think all will agree that the *hydrocitrate* should be the salt arranged for and produced; the chemical situation all bears that way. And the next thing is the dosage. Since 1882 I have made my supplies upon the basis explained to-day, stating the molecular structure, as given, in grains, and dividing the 5 molecules of hydro-citrate produced (1,070 grains), as held in solution, among four twelve-ounce bottles, sweetening, flavoring, and gas charge q. s., giving to each bottle 267.5 grains of the salt (rated still as anhydrous); during this long time none has ever spoiled, though samples have been laid aside for periods of trial; no complaint either as to effect or disturbance from lesser or greater "strength" in given lots.

Messrs. Stillé and Maisch state that the official preparation cannot be depended upon for constitution or uniformity of action; certainly, such criticism cannot apply when proper chemical balance is secured, for the salt then made is definite and keeps well even with loss of gas charge, does not readily crystallize, and if so by accident, is exceedingly soluble either in hot or cold water. In such case, then, all the alchemic rigmarole in process may be done away with, for this is simple and easy; the solution may be allowed to go on at its own pace or be hurried by heat. There need be no rush to stopper the bottle until the gas is introduced, and one bottle or ten thousand can be made at one batch, as may suit local needs, without fear of deterioration from keeping. My own directions to friends and others are as follows:

Materials in grains for producing solution of hydro-citrate of magnesium:

	One bottle.	Four bottles.	Twelve bottles
Carbonate Magnesium.....	121.	484	1452
Acid for the reaction.....	262.5	1050	3150
" " Potassium Salt.....	21.	84	252
" in total.....	283.5	1184	3402
Bicarbonate of Potassium ...	30	120	360

Salts and other products in the finished and bottled lots, stated in grains:

Hydrocitrate of Magnesium...	267.5	1070.	3210.
Citrate of Potassium.....	30.6	122.4	367.2
Gas as CO ₂	18.2	52.8	158.4

For the larger quantity dissolve the carbonate and the acid, each either in fragments or powder, and lemon oil 2 minims or q. s., in a large bottle, with 26 fluidounces of water; filter upon 1 pint of syrup, rinse the filter lightly, and bring to 48 fluidounces (allowing for 5 fluidounces space taken up by the products of decomposition), giving 4 fluidounces of sweetened solution for each bottle; fill with filtered water, add 30 grains bicarbonate of potassium, and immediately stopper tightly.

Others who have used this method and dosage have been as highly pleased as myself, and our committee will be glad to have it tried by as many as possible during the coming winter and spring, by which means to obtain a consensus of opinion for presentation to the future pharmacopœial committee.

In this case, as in many others, the carbonate is the best chemical form to use for reduction; occasionally there is a variation in that which we obtain, occurring, so far as we find, yet more often in foreign than in native brands; hence a test is offered which is convenient to the situation, taking advantage of the formation of neutral salt.

In a test tube or small bottle dissolve 14.5 grains citric acid and 10 grains carbonate of magnesium in powder with 1 fluidounce of water; allow the solution to stand until clear and for escape of CO₂.

* From a paper read at the September meeting of the Kings County Pharmaceutical Society.

The liquid should now be neutral to good test paper; in case it remains acid, then the carbonate is lacking in magnesium, and small portions are to be added gradually until saturation is produced.

Each 1 grain added indicating a loss of 10 per cent. $\frac{1}{4}$ grain = 1 per cent, and in similar ratio, keeping accurate account of the amounts used. The figures are derived from the following table:

Carbonate.	Acid.	Neutral Salt, anhydrous.	Crystallized.
100.	145.	155.	217.
10.	14.5	15.5	21.7
1.	1.45	1.55	2.17

N.B. In very damp weather, powdered carbonate will absorb moisture from the air and materially increase in weight; so, in case of suspicion, dry the sample before testing.

The committee found in three separate blocks of imported carbonate of magnesium a loss extending up to nearly 16 per cent as the greatest, different portions from each block being taken and mingled for an average of that piece.

So far as trials of American brands have been yet made, no variance was found, except one which made the basis of the note upon moisture, and that when dried out was found to be correct.

P.S. Any queries upon matters here spoken of will be cheerfully answered by the committee upon formulæ and revision of the Kings County Pharmaceutical Society, Brooklyn, N. Y.; Wm. P. De Forest, chairman, 397 Classon avenue; or the author of this paper, 40 Willow place.

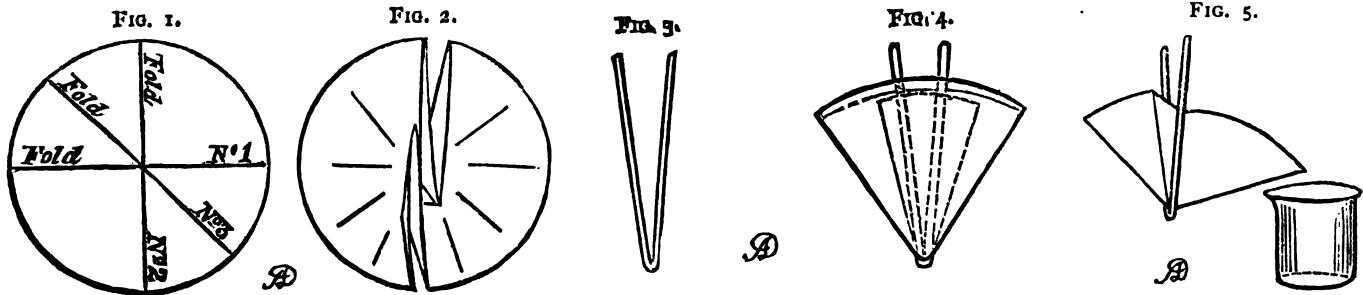
A New Vehicle for Typewriter's Ink.

VARIOUS formulæ have been published for the preparation of ink for use of typewriting machines, but, as far as I have learned, they have proved more or less unsatisfactory. This has, in great part, arisen from the use of glycerin as one of the prime constituents. The hygroscopic properties of this substance render its use ineligible under varying climatic conditions as to moisture, and the addition of glucose, soap, alcohol, or water does not remove this objection. Vaseline, with or without wax, gives better results in this respect; but a good consistence is not easily secured under extremes of temperature.

Some years ago, when specially interested in the study of inks, I made a number of experiments on a compound suitable for typewriter's use. The results were satisfactory in indicating the line of success, and the notes then made were laid aside until more leisure could be secured for their complete elaboration. Somehow or other that time has not arrived, and, lest another seven years should so elapse, I beg to turn over what little information I have to convey to those who are less busy or perhaps more industrious.

Many of the salts of the aniline series are soluble in castor oil; methyl violet is notably so. I am not prepared to state the limit of solubility, as with a vehicle of such consistence, and with pigments of such intensity, this is a difficult point to determine.

The amount dissolved is, however, relatively great, and advantage can be taken of this fact for the preparation of an ink of remarkable power, admitting of a large number



RAPID FILTRATION.

THE use of filter pumps, as every chemist is aware, does not, in a very great number of cases, facilitate filtration: first, because a dense layer of the precipitate forms next the paper which continually requires to be removed; and second, if any considerable pressure is used, particles of the precipitate will pass through.

To increase the surface seems to be the better plan. Plaited filters partially effect this, but the precipitate cannot be easily detached from them, and they are troublesome to prepare. Ribbed funnels, while also an improvement, have only one side of the filter for use, the other side being covered with three thicknesses of filter paper.

The following method enables filtrations to be made very rapidly, and in such a manner that the precipitate can be readily removed.

The filter paper is folded three times; folds Nos. 1 and 2 are toward the operator, No. 3 from him. The filter is then gathered (Fig. 2), and a piece of glass rod, bent at a very acute angle, inserted in the cleft of the filter (Figs. 3 and 4), thus giving a filtration surface of nearly four times the usual one.

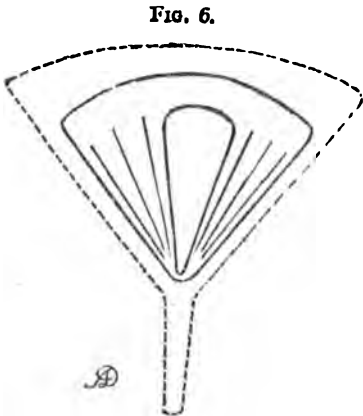
The filtration being complete, the glass rod is grasped by the projecting ends and lifted from the funnel, bearing the filter upon it. One end of the filter paper is then bent down, and the precipitate is easily washed off (Fig. 5).

An improvement on this is to use, instead of the glass rod, a plate of glass (Fig. 6) ribbed on both sides. This renders the filtration very rapid indeed, and if it were made by the manufacturers of chemical apparatus would no doubt be used.—REGINALD A. FESSENDEN in *Chem. News* (August 30th).

Chrysarobin in Hæmorrhoids.—Dr. Kossobudsky recommends highly an ointment containing $2\frac{1}{4}$ per cent of chrysarobin (instead of 5 per cent as recommended by Unna), as follows:

Chrysarobin	0.8
Iodoform.....	0.3
Ext. Belladonna	0.6
Vaseline.....	15.

If bleeding be present, tannin may be combined with it. It is stated that the use of this ointment twice or thrice daily will cause pain and bleeding to disappear in three or four days.



Fessenden's Rapid Filter.

of copies being taken from the same impression. Other anilines, as some of the blues and greens, may be substituted for violet, and the color may be varied, and permanency increased, by the incorporation of a quantity of the finest grade of lampblack. I did not experiment with nigrosin, but it is possible that it would produce a black of some intensity.

The incorporation and solution of the aniline colors in the oil may be accomplished, on the small scale, by triturating the previously powdered color with the oil in a mortar. The use of a little alcohol will sometimes be found to facilitate this operation. The ink may be applied to the ribbon by means of a tooth brush: and the ribbon may be of silk or fine muslin. Strips of very fine "lawn" answer admirably. On a larger scale,

the grinding and mixing of the color would of course be better done by revolving rollers, as in some forms of paint or chocolate mills, and the application of the ink to the ribbon could be easily provided for.—PROF. E. B. SHUTTLEWORTH in *Scient. Amer.* (Nov. 9th).

Purification of Litmus.

DR. OTTO FOERSTER prepares the pure coloring matter of litmus in the following manner:

Commercial litmus of best quality is first extracted by ordinary alcohol in the cold, then digested with water, the solution filtered and evaporated. (This is a combination of the processes proposed by Wartha and Mohr.) The residue is again dissolved in water, the solution filtered, and the filtrate precipitated with absolute alcohol mixed with a little glacial acetic acid. The precipitate is collected upon a filter and washed with alcohol. This causes a violet, fluorescent coloring matter to remain in solution. The remaining residue is once more dissolved in water, and the precipitation, filtration, and washing repeated. At this stage, a red coloring matter, which has a violet tint in an alkaline liquid, remains in solution.

After once again repeating this process, only a small amount of the last-named coloring matter remains in solution. The precipitate upon the filter is then dried, being repeatedly moistened, during the drying, with alcohol, for the purpose of expelling the acetic acid. The precipitate is then again dissolved in water and the solution filtered. Finally the coloring matter is precipitated with alcohol rendered faintly alkaline with ammonia, then collected upon a filter, washed with pure alcohol, and dried.—After *Zeitsch. f. anal. Chem.*, 1889, 428.

Notes on Commercial Drugs, Chemicals, and Essential Oils.

[From the September report of Gehe & Co., of Dresden, and the October report of Schimmel & Co., of Leipzig.*]

Acid, Sclerotic and Sphacelinic.—Both of these substances, which have for some time been regarded as representatives of the oxytocic action of ergot, are greatly falling off in use, and will probably soon cease to be employed. The opinion is gaining ground that the specific effects of ergot depend upon nitrogenous decomposition products of a basic character, which bear some analogy to the ptomaines.

Balsam of Peru.—Gehe & Co. reaffirm their former statement that Kremel's proposed method of testing balsam of Peru, by determining what Kremel calls the "acid" number and the "ester" number, is not reliable.

Codeine.—According to Dr. Dornblueth, codeine is a reliable sedative, in maniacal excitement, in doses of $\frac{1}{4}$ to 1 grain. It is best used by way of hypodermic injection of the phosphate of codeine. In the treatment of the morphine habit, it has frequently alleviated the agony caused by enforced abstinence. Since it does not affect the functions of the intestines, it has become a favorite remedy for cough, particularly in phthisical patients.

Cornutine.—This alkaloid, discovered in ergot by Dr. Kobert, is in considerable use among gynecologists. Dr. Thomson, of Dorpat, recently made an extended study of its effects, and found that it is especially effective in atonic hæmorrhage after birth. Unfortunately it is very unstable [in solution] and high in price [1 Gm. is quoted by Gehe & Co. at 40 marks]. Dr. Thomson recommends the following formulæ:

1. Cornutine..... $\frac{1}{4}$ grain.
Distilled Water 150 min.
Hydrochloric Acid..... 4 drops.

Dissolve. Keep in a dark [amber-colored] vial. Dose: 15 minims hypodermically.

2. Cornutine..... 4 grains.
White Bole..... 140 "
Glycerin and Water q. s.

Make 60 pills. Dose: 2 to 3 pills daily.

Creolin.—As might have been expected, the exaggerated laudations of this recently introduced disinfectant have overshot the mark. Experience has shown that it does not possess all the advantageous properties originally assigned to it.

Cubebs.—Gehe & Co. point out the fact (which has been observed in other markets) that most shipments of cubebs represent berries collected at different stages of ripeness. The following four kinds may generally be distinguished:

1. Small, insignificant, strongly shrivelled fruits, scarcely 2 Mm. in diameter, of a grayish-brown to grayish-black color, being in the first stage of ripening. The stem is one and one-half to two times the length of the fruit. The seed is shrivelled and scarcely recognizable.

2. Somewhat larger fruits, of grayish-black color, 4 to 4.5 Mm. large, full of close but not deep (sometimes quite shallow) wrinkles. Stem as long, or one and one-half times as long, as the fruit. The seed is either fully developed—and in this case round and adhering by its base—externally of a brown, internally of yellowish-gray color, appearing horny towards the surface; or it is contracted and of a darker tint.

3. Fruits of a diameter of 5 Mm. and over; stem 5 to 7 Mm. long; color more grayish-brown; wrinkles deeper and not numerous. Seed usually developed, globular, grayish-brown, internally yellowish-white, often mealy, seldom horny.

4. Besides the three kinds here mentioned, most parcels contain from 5 to 10 per cent of yellowish-brown fruits with an easily detachable, corky epidermis. The pericarp is quite friable and does not resist when pressed between the fingers. The seed is not developed, attached to the base in form of a more or less large, shapeless mass. These fruits appear to be genuine cubebs retarded in their development by fungi or unfavorable weather.

These four sorts behave towards concentrated sulphuric acid in the following manner:

Nos. 1, 2, and 4 at once impart a blood-red color to the acid. No. 3 imparts a yellow to yellowish-brown color, which becomes blood-red after one or several hours.

The aqueous decoction of all four sorts yields the starch reaction with iodine. This is most feeble in No. 1. In Nos. 2, 3, and 4 it is of equal intensity.

Not seldom so-called "false cubebs" are found in the parcels. These are characterized by the fact that the seed adheres in all parts to the pericarp. The shape of these fruits varies; they are either round—and in this case usually without stems—or they are more or less pear-shaped and have a stem. For pharmaceutical purposes, the kind described under No. 2 is most to be recommended. But under present circumstances this is not often available, and less desirable grades have to be used.

Hydrogen Peroxide.—The use of this agent, particularly in the arts, as a bleaching and oxidizing material, is steadily increasing. It is, however, necessary that those who use it, or intend to use it, should be instructed as to the best method of employing it. Most complaints which reach the dealer or manufacturer as to its inefficiency may be attributed to faults in manipulation. In general it may be stated that hydrogen peroxide is most effective when in a weakly alkaline solution. Moreover, the commercial article is usually too strong, and needs dilution even as far as 1 per cent. If a solution has been rendered alkaline for use, and if it has not been exhausted by the process for which it has been employed, it may be preserved by slightly supersaturating it with an acid and keeping it in a cool place.

Musk.—The recent invoices of Tonquin musk possess a less penetrating odor than those heretofore shipped. The reason is said to be this, that the musk-deer hunters, owing to the increased demand, no longer wait for the season when the deer descend into the valleys, when they are in rut, at which time the musk has its strongest odor. The hunters now make excursions into the mountains and kill the deer wherever and whenever they can get at them.

Oil of Bay.—Dr. Otto Mittmann has recently made a study of oil of bay, and reports as constituents the following:

1. Terpenes:
 - a. Pinen.
 - b. Dipenten (very probably).
 - c. a Polyterpen (probably Diterpen).
2. Eugenol, as chief constituent.
3. Methyllic Ether of Eugenol (a little).

The spec. grav. was found by the author to be 0.970 at 15° C. It forms a clear solution only with ether, petroleum ether, carbon disulphide, and chloroform. With alcohol and glacial acetic acid it forms a turbid solution (S.).

Oil of Cinnamon.—In view of the suspicious character of all oil of cassia distilled in China, and the practical impossibility of absolutely controlling its purity, Sch. & Co. recommend that the next Pharmacopœia only recognize the oil of true or Ceylon cinnamon, the physical constants of which are well known, and the purity of which can be readily controlled (S.). [It will be well to bear this recommendation in mind for the next U. S. Ph.]

Oil of Citronella.—The frequent adulteration of this oil with certain petroleum distillates has led Schimmel & Co. to make comparative tests of genuine and adulterated oil. It was found that when alcohol of 80 per cent by volume was used as a solvent, the pure oil, as well as that which contained only a small proportion of the adulterant, was easily and largely soluble in the menstruum; but that the solubility decreased rapidly, in proportion to the increase of the adulterant. A mixture of 90 parts of genuine oil with 10 parts of petroleum formed a slightly opalescent liquid when mixed with 5 parts of 80-per-cent alcohol. With 10 parts of the latter the mixture was milky. On mixing them in equal parts, or in the proportion of 3 of oil to 4 of the alcohol, the liquid was clear and solution perfect. In presence of 20 per cent petroleum, milkiness appeared on mixing 1 part of the oil and 5 of the alcohol. With more petroleum, less alcohol was required for the milkiness to appear.

As a general result from their investigations, Schimmel & Co. recommend that oil of citronella of the market should comply with the following requirements:

One part of the oil, when thoroughly agitated with 10 parts of alcohol of 80 per cent by volume, should yield a clear solution.

If the character of cloudiness or milkiness, which will appear with an adulterated oil, is observed, and if it be ascertained whether the undissolved portion will finally settle to the bottom or swim on top, the probable nature of the adulterant may be recognized. Fixed oils will sink to the bottom, petroleum will rise to the top.

In addition to the above requirement, Schimmel & Co. also recommend to demand of the oil a spec. grav. not less than 0.895 at 15° C. (S.).

Oil of Cloves.—Oil of clove stems has long been, and is still being, used as a common substitute or adulterant of true oil of cloves. The two oils cannot well be distinguished by the spec. grav., which varies only slightly in the third decimal, but the difference can be recognized, after some practice, by the odor.

Schimmel & Co. state that they consider the spec. grav. given for oil of cloves in the last German Pharmacopœia (II.)—viz., 1.041–1.060—to be too low. Schimmel & Co. find the spec. grav. of oil of cloves to be 1.067 at 15° C., and of oil of clove stems 1.063 at 15° C. They have never seen a genuine oil of cloves with so low a spec. grav. as 1.041. For this reason they recommend that the next Pharmacopœia should require for oil of cloves a spec. grav. not below 1.060.

Oil of Eucalyptus.—Schimmel & Co. report that the oil of *Eucalyptus odorata* contains a copious quantity of eucalyptol and may be used in place of that of *E. globulus*. Its spec. grav. is 0.907 at 15° C. An oil from *E. globulus* distilled in Southern Spain, which came into the hands of

* Notes taken from the latter are distinguished by the letter S at the end.

Schimmel & Co., contained an unusually high percentage of eucalyptol, besides such a quantity of cineol that the oil congealed to a stiff magma by refrigeration. Its spec. grav. at 15° C. is 0.931. Schimmel & Co. report that the Californian oil of eucalyptus has recently shown such variations in the percentage of eucalyptol that they will no longer have anything to do with it. The fault seems to lie with the producers, who now offer eucalyptol besides the oil, and who probably attempt to sell oil deprived of eucalyptol as unsophisticated. A good oil of eucalyptus should contain between 50 and 70 per cent of eucalyptol (S.).

Oil of Juniperus Oxycedrus.—This is the essential oil of the "cade" tree, the same which yields the tarry oil of cade. It is a new Spanish product, resembling pine-needle oil. We mention it here only as it has been used as an "energetic abortive" (S.).

Oil of Mirbane.—Schimmel & Co. call attention to the poisonous character of nitrobenzol, which seems occasionally to be overlooked or forgotten. Even the vapor alone, when inhaled for some time, can cause symptoms of poisoning. These symptoms are: a peculiar pallor ("lead-like") of the skin, and a heavy feeling and a sense of cold in the extremities, particularly in the hands and feet. In more severe cases there is unsteadiness in walking, a condition somewhat resembling drunkenness, and inability to stand up, so that the affected person may be falsely supposed to be under the effects of alcohol. The urine has a dark color and an odor of bitter almonds (S.).

Oil of Peppermint.—Schimmel & Co., who have, of course, a most lively interest in the statistics of peppermint culture, not only in Europe but also in this and other countries, have obtained, through their confidential agents, an exact account of the extent of the cultivation in Wayne County, New York, and adjoining districts. Their report is accompanied by a map showing the separate townships. The several townships contain the following number of acres under peppermint cultivation:

I. Wayne County:

Acres.	Acres.
Arcadia.....874	Huron.....89
Lyons.....498	Williamson.....34
Palmyra.....880	Savannah.....29
Sodus.....835	Macedon.....25
Galen.....815	Butler.....17
Rose.....252	Walworth }.....10
Marion... ..204	Wolcott }

II. Ontario County:

Phelps... ..188	Manchester.....40
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III. Seneca County:

Junius.....48

These 3,323 acres are owned by a large number of proprietors. Most of the oil is bought up by commission agents, and their principal aim is to secure the production of those farmers who carry on the cultivation with the best care and keep their fields clear of weeds (S.).

Oil of Peppermint, Japanese.—In their last report, Schimmel & Co. stated that there were two "harvests" of peppermint herb in Japan. This was not meant literally, the intention being to say that the herb was "cut" twice, once in September to October, and again in November to December.

While the Japanese heretofore recognized 50 per cent of menthol as a normal quantity which might be demanded to exist in the crude oil, they have now lowered the standard to 30 per cent. [No reason is mentioned. But it is not difficult to guess it.] (S.)

Oil of Rose, German.—The cultivation of roses for the production of oil of rose, rose water, etc., in the vicinity of Leipzig has passed the experimental stage. A large tract, comprising 500,000 square meters, has been acquired in the vicinity of the city, and will be stocked with about 250,000 plants during this fall. Up to the present, the cultivation has been carried on at a much smaller scale, but the products were of such superior quality that they readily brought prices far beyond those paid for the same products made elsewhere (S.).

Oil of Rose, Turkish.—Schimmel & Co. have determined the average natural percentage of stearopten existing in the oil as distilled in the season of 1889 (in genuine oil). This was found to be 15 per cent.

In 1888 it was 14 per cent, and in 1887, 12 to 13 per cent. Pure oil of rose of 1889 congeals between 18.5° to 19° C. (65.2° to 66.2° F.), and melts at 19.5° to 20° C. (67° to 68° F.) (S.).

Oil of Sandal, East Indian.—Schimmel & Co. have, on a former occasion, recommended that the Pharmacopœia fix the spec. grav. of this oil at 0.970 to 0.975 at 15° C. They have confirmed these figures by further experience (S.).

Oil of Thyme.—In their last report, Schimmel & Co. stated that their own pure product did not stand the test

of the German Pharm. II.—which says that the oil is soluble in half its weight of alcohol, forming a solution which should not be colored yellowish-brown by 1 drop of solution of ferric chloride—but that this test corresponds to an oil deprived of thymol.

Schimmel & Co. now again assert that a pure, unadulterated oil of thyme, not deprived of its phenols, when treated with ferric chloride, yields a dirty greenish-brown color, afterwards becoming reddish. The reason is this, that the oil contains, besides thymol, another phenol, which is still under examination and will be reported on later. It is to this second phenol that the color reaction is due.

If oil of thyme is treated with caustic soda solution, and the thymol as well as the other phenol thereby removed, the remaining oil will answer the iron test of the Pharmacopœia, but will no longer deserve the name of "oil of thyme."

It follows that, if a pure oil of thyme is wanted, such an oil should be selected which does not answer to the iron reaction of the Ph. Germ. II. (S.).

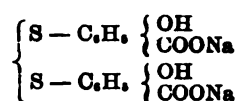
Oil of Wintergreen.—Schimmel & Co. deny the correctness of the results obtained by Messrs. Trimble and Schroeter (reported in abstract, from the *Amer. Jour. of Pharm.*, in our last September number, page 173). These chemists reported that the artificial oil of wintergreen, designated as "a representative sample of the commercial artificial product," contained about 15 per cent of benzoic acid. The authors did not mention the producer's name, but as Schimmel & Co. are the only firm which has imported the artificial oil in the United States, they feel that their product is the article complained of. Schimmel & Co. deny the existence of any benzoic acid in the product. This denial is based (1) on the guaranteed absence of benzoic in the salicylic acid used in the process; (2) on their own investigation, which proved to them that no benzoic acid could be produced during the process of manufacture; (3) on their inability to find any benzoic acid in the artificial oil (S.).

Quinine Sulphate.—The new Austrian Pharmacopœia has adopted Kerner's test as modified by Jungfleisch. The amount of water of ammonia (spec. grav. 0.960) has been fixed at 7.5 C.c. (at 15° C.). [The U. S. Ph. directs, at 15° C., 7 C.c. of water of ammonia, and at 16° C. 7.5 C.c.] The above quantity of ammonia corresponds with a purity of 95 to 96 per cent.

Saffron.—The old custom of adulterating saffron does not seem to die out. Gehe & Co. report that they had been offered saffron, by a "respectable house in Spain," which had been deprived of natural coloring matter, then dyed with dinitrocresol, and weighted with inorganic matter. The adulteration was done so neatly that it had at first been entirely overlooked. It is reported that very barefaced adulterations are carried on at Novelda, in the province of Alicante, which sells most of its product to Marseilles houses. The proportion of adulterant is said to have reached 40 per cent. Aside from physical characteristics, determination of ash, etc., a very valuable preliminary test is to treat it with sulphuric acid, whereby a blue tint is produced in presence of most of the usual adulterants.

Simulo.—Attempts have been made in England to cultivate the plant yielding the simulo fruit, *Capparis coriacea* (a species of caper), in hot-houses. The result has not been satisfactory. After three years' careful nursing, the plants are not over ten inches high.

Sodium Dithiosalicylate.—This new salt is recommended as a substitute for the salicylate in acute articular rheumatism, and is said not to produce any secondary symptoms. So far as known, it is the neutral sodium salt of an acid, derived from salicylic acid through the replacement of 2 atoms of hydrogen by 2 atoms of sulphur, in 2 molecules of the acid joined together:



The salt is a yellowish-gray powder of a peculiar aromatic odor, recalling that of iodoform. It is easily soluble in water. On adding a mineral acid to the solution, the acid separates in form of an oily and resinous mass. According to Dr. Lindenborn, the dose amounts to 3-30 grains every three or four hours.

Somnal.—This name designates a new hypnotic, prepared by combining chloral and ethyl-urethane. It is a clear, colorless liquid, easily soluble in alcohol and water. The dose is 45 to 90 grains. [Regarding this substance and certain related products, see No. 2,386 of "Queries and Answers," November number.]

Sugar of Milk.—The North-German product is preferred, according to Gehe & Co., in consequence of its handsome quality and comparatively low price. [We have had occasion to examine an invoice shipped to this country, and can confirm the report of its good quality.]

Tar as a Deodorizer of Iodoform.—Nagel (*Rep. de Pharm.*) says that a mixture of 5 parts of iodoform with 100 parts of tar has no appreciable odor of the former.

Hair Restorative.—*The Lancet-Clinic* says that a solution of chloral hydrate of a strength of 5 grains to the ounce of water will clear the hair of dandruff, and in many cases of baldness will cause a renewal of growth of hair[?].

Arnica oil, well rubbed into the scalp, in small quantity, three times a week, will also be beneficial in the latter class of cases.

Ticket Writers' Ink.—To 1 gill of black ink add $\frac{1}{2}$ ounce of gum. Let it stand in a warm place, and shake it frequently. When dissolved, if too thick, add more ink; if too thin, more gum. It will produce a fine glossy letter. You may treat blue, or red, or other colored ink in the same way with an equally satisfactory result.

Ink for Writing on Photographs.—The following formula produces an ink serviceable for marking proofs; the writing being executed on a dark portion, the lines soon bleach by the conversion of the silver into an iodide:

Iodide of Potassium	10 parts.
Water.....	30 "
Iodine.....	1 part.
Gum.....	1 "

Arecoline.—Arecoline is the name given by Jahns to an alkaloid which he discovered in areca nuts, and which Marmé regards as the tænicidal principle of the nut. Zimmer & Co. offer it in form of hydrobromate of arecoline, in handsome crystals.

Detection of Chicory in Coffee.—M. Baumert founds his process on the excess of chlorine in chicory, which is nine times greater than in coffee. He incinerated 25 Gm. of genuine coffee, treated the ash with an alkali, and lixiviated it with water slightly acidified with nitric acid. The liquid required 7.5 C.c. of normal silver nitrate. The same quantity of chicory requires 70 C.c. of the solution (1 C.c. represents 1 Mg. of chlorine).—*J. d. Ph. de Lorraine.*

The Currant Crop of Greece.—Last year the growing crop of currants in Greece reached a total of 150,000 tons. Just this quantity has been shipped up to the present (July, 1889), and about 8,500 tons are still remaining, most of it, however, of very inferior quality, fit only for the local distilleries. Thus the total crop has proved to be 158,500 tons, or the largest by about 30,000 tons ever produced.

The direct shipments to the United States from the crop of 1887 were 13,037 tons, but, notwithstanding the very plentiful supply, the consumption in the States has not increased.—*U. S. Cons. Reports.*

Chelidonium Alkaloids.—This was one of the subjects brought before the late meeting of German Naturalists (Department of Pharmacy) by Prof. Ernst Schmidt.

Chelidonium root contains chelerythrin, chelidonine, and nearly a dozen more of alkaloids. The composition of chelerythrin is still unknown; that of chelidonine is $C_{10}H_{11}NO_4 \cdot H_2O$. Another alkaloid is *protopine*, of which it is as yet undecided whether it contains 20 or 21 atoms of carbon. Protopine has also been found in *Sanguinaria Canadensis*, *Eschscholtzia Californica*, and a few other plants. It has been asserted that the last-named one (*Eschscholtzia*) contains morphine, but this is denied by the author. The error was caused by the fact that the physiological effects of protopine resemble those of morphine. The chelidonium alkaloids, in general, possess more or less of the physiological effects of morphine.—*Chem. Centralbl.*

Atropine and Hyoscyamine.—Prof. Ernst Schmidt reported at the late meeting of German Naturalists that he has investigated the claim made by E. Schering's chemists, who announced that belladonna did not contain any atropine originally, but only hyoscyamine. He finds that older belladonna roots contain only hyoscyamine, but that fresh ones actually contain pre-existing atropine.—*Chem. Centralbl.*

Avalte.—At Avala, near Belgrade, Servia, quicksilver is abundant in conjunction with a green-colored mineral named avalite, the properties of which are still unknown. It is hoped that, amongst other uses, it may be found possible to apply it as a substitute for arsenic as a coloring body, in which event the discovery will prove very valuable, as avalite is said to be free from the poisonous qualities which make the employment of arsenic so dangerous. The mine was discovered by Professor Kleirics, of Belgrade.

The Harmlessness of Creolin.—An interesting case of creolin poisoning happened the other day at Berlin. A laborer, employed in a chemical factory, with the intent to commit suicide, swallowed not less than eight ounces of creolin. Dr. von Ackeren, who published a detailed report on the case, observed only very slight and passing symptoms of poisoning, whilst the patient perfectly recovered. The fact that a dose of eight ounces was not

sufficiently toxic speaks greatly in favor of creolin, which, though a powerful disinfectant, is comparatively harmless to the human organism. If we consider that the tenth part of carbolic acid would have proved fatal to the man, we cannot deny that it is of great advantage to possess non-poisonous antiseptics like creolin.

The Dose of Chloralamide.—The results of experiments by Dr. Lettow respecting the therapeutic use of chloralamide are said by him to be:

1. Chloralamide is a very efficacious and useful hypnotic, though it is no panacea for all cases of insomnia.
2. The greatest advantage over other hypnotics consists in its having no influence whatever on pulse, respiration, or temperature.
3. After-effects are very scarce, if occurring at all; they consist of slight headache or a trace of giddiness.
4. The safe dose for an adult is 45 grains.
5. The drug is best given one to one and one-half hours before the desired sleep is intended to commence.
6. Chloralamide when given as an enema is very reliable.
7. The hypnotic effect is occasionally prolonged over part of the following day.—*Provincial Med. Journal.*

Label Paste.—While making flour paste one day it occurred to Mr. Patton that, by converting part of the starch of the flour into dextrin by the action of an acid, he might improve its adhesiveness. Accordingly, he added some hydrochloric acid, and the result was better than anticipated. The product was a very white, smooth paste. With this paste he found no difficulty in attaching labels to tin or other smooth surfaces. The following is the formula:

Wheat Flour.....	1 lb.
Alum.....	3 ij.
Borax.....	3 ij.
Hydrochloric Acid.....	$\frac{3}{4}$ iss.
Water.....	$\frac{3}{4}$ xvj.

Mix the flour, alum, and borax, and stir to a smooth paste with the water; then add the acid and heat until the starch cells break, stirring constantly.

This makes a very thick paste, which must be thinned with water as wanted for use. A small quantity of essence of wintergreen poured over the paste in stock will preserve it indefinitely.

Castor-oil Chocolate.—As a means of making castor oil palatable, Mr. Giraud recommends its incorporation with chocolate. This is done by working into a mass, on a warm plate, 50 parts of cacao powder freed from oil, 50 parts of castor oil, 100 parts of powdered sugar, and vanilla sufficient for flavoring. The product may then be formed into tablets or pastilles. It will be seen that the castor oil is here made to take the place of the removed cacao fat. About 10 Gm. of the compound is a sufficient dose for a child.—*Pharm. Jour.*, from *Pharm. Zeitung.*

Oil of Cedar.—According to a note in the *Garden and Forest*, the distillation of oil of cedar (*Juniperus Virginiana*), which has long been carried on in the pencil mills at Cedar Keys, in Florida, from sawdust and wood of inferior quality unsuitable for pencil-making, is likely to be carried on in other States, since straight-grained timber, suitable for pencil-making, is becoming scarce in Florida and along the streams of the western coast, where the best used to be found.

Turpentine baths recommended for rheumatism, etc., are, according to Pinkney (*D. Med. Ztg.*), best prepared in the following way: A highly concentrated solution of soft soap is thoroughly agitated with 3 to 4 ounces of turpentine. This emulsion is put into the bath, and, on opening the water tap, it is gradually and thoroughly mixed with hot water.

Pharmacology of the Iodides of Potassium and Sodium.—Dr. Gay, who has been studying this question, has formed the following conclusions: (1) The iodides of potassium and sodium of commerce are generally impure; the druggist should be very careful to examine these drugs, and to reject all containing less than 95 per cent of iodide, or which contain iodate. [These strictures regarding the purity of iodides do not apply to the same extent to our market.—*Ed. Am. Drugg.*] (2) The iodide of sodium has always a weaker percentage, from 80 to 85 per cent; the dried iodide is not purer than the crystallized; medical men should allow for these facts in their prescriptions. This salt, which is very hygrometric and difficult of manufacture, would perhaps be better abandoned. (3) The iodide of potassium may be obtained pure at a reasonable price, and its preparation is one which pharmacologists might undertake for themselves. The preference given to iodide of sodium by some physicians is not justifiable.—*Gaz. Hebdom. de Montpellier.*

The American Academy of Medicine is endeavoring to make as complete a list as possible of the alumni of literary colleges, in the United States and Canada, who have received the degree of M.D. All recipients of both degrees, literary and medical, are requested to forward their names, at once, to Dr. R. J. Dunglison, Secretary, 814 N. 16th Street, Philadelphia, Pa.

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The AMERICAN DRUGGIST is issued in the latter part of each month, dated for the month ahead. Changes of advertisements should reach us before the 10th. New advertisements can occasionally be inserted after the 18th.

REGULAR ADVERTISEMENTS according to size, location, and time. Special rates on application.

EDITORIAL.

THE completion of eighteen years of its publication affords the editors of the AMERICAN DRUGGIST occasion for thanking its patrons for their liberal support and encouragement, and for a renewal of assurances that the policy of the journal will continue to be the greatest good for the greatest number.

EARLY in the history of the journal it advocated the organization of the profession of pharmacy for the mutual advantage of pharmacists, and for a number of years a considerable amount of space was given in the body of the journal to the reports of transactions of the associations which were established. The rapid increase in the number of such organizations has, however, rendered it impossible to keep up the department devoted to association news without reducing very considerably the space which it seemed desirable to give to the corresponding increase in the amount of scientific materials at hand. Moreover, the establishment of numerous pharmaceutical journals devoted to the promotion of local interests, and, among others, the development of local associations, has in a measure relieved us of the necessity for making this journal so largely a newspaper as would otherwise have been the case. The editors have, therefore, been the more willing to make association and personal notes subordinate to scientific intelligence.

ESPECIAL pains are taken to publish only that which is reliable and susceptible of being made practically useful in the daily work of pharmacists. In furtherance of this design, the material selected has covered as wide a range as is consistent with the province of a pharmaceutical periodical, and it is believed that its pages will show that, from the beginner in pharmacy to the specialist in pharmaceutical chemistry and pharmacology, no one class has been favored more than another.

IN the matter of illustrations, no pharmaceutical periodical in existence has given its readers so numerous or elaborate engravings; about one hundred and fifty having appeared in this volume. The AMERICAN DRUGGIST was the first to give any considerable attention to matters of art and taste as applied to the construction, decoration, and furnishing of the pharmacist's place of business.

Several papers on this subject, illustrated, as in previous volumes, with the work of excellent artists, have appeared during the past year, and the series will be continued as occasion and materials are met with.

IN the line of elementary studies and work of the drug clerk will be found the series of papers on the Art of Dispensing. These will be continued in the next volume, and will afford the apprentice in pharmacy a knowledge of the most approved methods of the day.

IN the matter of Original Communications, we have published several papers of great value, and while no special effort has been made to secure materials of this character, the editors are glad to receive communications relating to all matters allied to pharmacy. It must be understood, however, that communications for original publication in the AMERICAN DRUGGIST must be sent to it alone, if it is desired that they shall appear in full; otherwise the editors will exercise their prerogative of eliminating all portions not of primary importance.

THE department of Queries and Answers represents no inconsiderable amount of labor; but so long as our correspondents confine their inquiries to matters of more or less general interest we shall always be glad to hear from them, and will do the best we can to make rough places smooth.

WISHING you all a Merry Christmas, and that the New Year may be one of happiness and prosperity, we bring our labors on this volume to a close.

WE are indebted to Mr. Eugene Spangenberg, of Olin, Ohio, for the following bit of quaint humor showing that the art of raising the wind is not a modern accomplishment so far as the clergy are concerned:

"A paper printed in Krausenburg, Austria, on the occasion of the recent celebration of the centenary of Cardinal Haynald, relates the following story on the authority of one well acquainted with those who know the reverend gentleman and were familiar with the circumstances.

Haynald, Bishop of Siebenburgen, stopped, on his return from a confirmation tour, at a small place named Torda, and being detained a day longer than was expected, his secretary, Lonhart, found to his dismay that they had not enough money to pay the hotel bill. Now a bishop cannot very well run away without paying what he owes, nor does his sense of dignity permit him to plead even temporary pecuniary embarrassment. Still, the bishop managed to avoid either dilemma. He sent a waiter to the apothecary of the place, a Mr. Gabriel, with whom his Grace was acquainted, with the following recipe, which has since been preserved by the several successive proprietors of the establishment:

B Notam austriacam
Numero
Ducenta

D. S.—For one day's use only.

DR. HAYNALD.

The druggist's clerk, being somewhat rattled by the sudden interruption of his sleep, tried in vain to understand the nature of the prescription, and after fruitless consultation of his works of reference, awakened his employer, who, after reading the recipe, sent his clerk again to bed, and said he would himself prepare the prescription. He put 200 guilders in notes into a powder box, duly sealed, labelled, and inscribed, and sent it to the bishop, saying to the messenger that in case the powder should not be sufficient he would be glad to send a second dose. This, however, was not necessary, and the first dose, after "one day's use only," was returned with thanks.

The next meeting of the North Dakota Board of Pharmacy will be held at Grand Forks, N. D., on the 6th day of January, 1890. All persons desiring to come before the Board at that meeting will apply for blanks to the secretary, Frank Frisby, Bismarck, Dak.

The Section on Commercial Interests of the American Pharmaceutical Association desires to receive from the various Pharmaceutical Associations, both State and local, all reports upon matters relating to commercial interests, and would be pleased to hear from committees on trade interests upon any matters relating to trade topics, reports, circulars, etc., to be sent to the secretary of the section, F. B. Kilmer, New Brunswick, N. J.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,392.—Prescription Difficulty (Binghamton).

We are asked how the following prescription should be prepared:

Rj Acidi Arseniosi.....gr. i.
Tr. Ferri Chlor.....iv.
Glyceriniiss.
Aque.....q. s. ad. 3 iv.

M. S. A teaspoonful in water after each meal.

We would recommend the following way: Reduce a small quantity of arsenious acid to a very fine powder, weigh out 1 grain, place it in a small flask or large test tube together with $\frac{1}{2}$ fl. oz. of water, and boil briskly for about five minutes. The acid will probably not all be dissolved. Now add about 10 drops of hydrochloric acid, and boil again, when solution will rapidly take place. Cool off the liquid, add it to the glycerin, add enough water to make $3\frac{1}{2}$ fl. oz., and lastly add the tincture of iron.

Do not boil the arsenious acid with strong hydrochloric acid, and then dilute with water. This will cause loss of arsenic, part of which will be volatilized as arsenious chloride. The same would happen if you were to attempt to dissolve the arsenious acid in the tincture of iron by heat, particularly if the latter, as usual, contained free hydrochloric acid.

No. 2,393.—Compound Quinine Tincture (Loomis) (A. McC., Hartford, Conn.).

Tinctura Quininae Co. (Loomis), as given in the formulary of the hospitals under the Commission of Public Charities and Correction of this city, is:

Quininae Sulphatis.....gr. 16.
Tinct. Aurantii Dulcis.....f 3 2.

Dissolve.

No. 2,394.—Cold Cream (H. M.).

By following the formula of the U. S. Ph. for Unguentum Rosae, a very handsome "cold cream" will be obtained.

Another formula is given here (after Cristiani):

Beune Oil.....12 oz.
Rose Water, triple.....8 "
Spermaceti.....4 "
White Wax.....2 "
Oil of Rose.....20 drops.

Melt the wax and spermaceti with the oil in a porcelain vessel, which should not be too shallow. When melted, place the rose water where it can run very slowly into the paste; keep stirring until it is thoroughly mixed, then add the oil of rose, and transfer it to suitable porcelain jars.

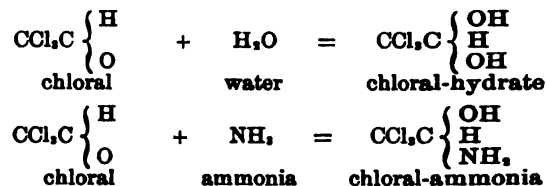
The stirring may with advantage be done with a quirl, or, when larger quantities are to be prepared, with some form of egg-beater.

No. 2,395.—Chloralamide (B. and J.).

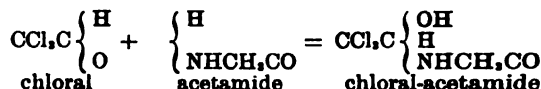
Our correspondents will find several brief notes on this new hypnotic in our last issues. In addition, we place here a translation of the note on chloralamide contained in the new (4th) edition of Fischer's "Die neueren Arzneimittel."

Chloralamidum (Chloralamid, Chloralformamid). Under this name, the "Chemische Fabrik auf Aktien," formerly E. Schering, of Berlin, puts a preparation upon the market, which has been tested upon the suggestion of Prof. Mering, and has been recommended as a hypnotic by Reichmann, Hagen, and Huefler. The name "chloralamide" is not well chosen. Certainly no chemist would suspect that the substance denoted by it is a combination of chloral with formamide.

Chloral shares with all aldehydes the property of forming addition-products. Thus, it may add to itself water and ammonia:



Jacobsen has, moreover, shown that chloral combines not only with ammonia, but in general with primary derivatives of ammonia, with amides and amines, by simple addition. Thus he prepared chloral-acetamide by acting with acetamide upon chloral.



Now, the so-called "chloralamide" is the corresponding compound obtained from chloral and formamide.

Regarding the actual preparation of the new compound, which had not previously been described, nothing has been published. (A patent has been applied for.) Nevertheless, it is most probable that it is prepared by mixing molecular weights of anhydrous chloral (not chloral-hydrate) and formamide.



According to this constitution, the compound should preferably have been called "chloralum formamidatum."

This name would have had the advantage of being based on analogy, since we [meaning Europe, and especially Germany] designate a compound of chloral and water as "chloralum hydratum," and a compound of chloral and alcohol, "chloralum alcoholatum."

The so-called chloralamide forms shining, white crystals, which have a slightly bitter taste. It melts at 115° C., and when distilled splits up into its component bodies. It is slowly soluble in about 10 parts of cold water and in 1.5 parts of alcohol. It is more readily soluble in hot water, but the temperature must not exceed 60° C. (140° F.), since otherwise the compound is decomposed into chloral and formamide (or ammonium formate). This same decomposition is brought about with the greatest ease by the action of alkalis, while acids have no effect upon it.

It is probable that chloralamide is split up, by the alkali of the blood, into the components before mentioned, and that its hypnotic action is based upon this. It is said to possess certain advantages over chloral, particularly that it is without influence upon respiration and the action of the heart, that it does not diminish blood pressure, and does not affect digestion.

The hypnotic dose is 15 to 45 grains.

Considering that the compound contains 76.6% of chloral, the greatest single dose would have to be fixed at 60 grains, and the largest daily dose at 120 grains.

BIBLIOGRAPHY.

THE PRACTICE OF PHARMACY. A Treatise on the Modes of Making and Dispensing Official, Unofficial and Extemporaneous Preparations, etc. Second Edition, enlarged and thoroughly revised. By JOSEPH P. REMINGTON, Ph.M., F.C.S., etc. 8vo. Philadelphia, 1889, J. B. Lippincott Company.

We have not reprinted the whole title of this work, but only the essential features, for it is so well known that the first four words alone would be sufficient to particularize it. The new edition before us bears ample evidence of careful revision throughout. Among the most notable improvements is a copious enlargement of the chapter on Magistral Pharmacy, both in text and illustrations. Under the head of Prescriptions, we find 30 pages devoted to the reproduction of 100 ac-

tual prescriptions, selected as typical either of some fault, error, carelessness, or of some other peculiarity likely to bother a novice, with full commentary on the features which are objectionable or require special explanation for other reasons. The collection of formulæ at the end has been enlarged by the incorporation of the National Formulary. A new chapter has been inserted in Part I. showing the application of the arithmetical process of alligation to pharmaceutical problems. This is certainly of great utility. The chapters on pharmacopoeial substances and preparations are followed by a judiciously selected series of questions covering the subjects taught.

Altogether the work has been brought up to our present state of progress in pharmaceutical art and knowledge, and forms one of the books which no practising pharmacist can do without.

PROCEEDINGS of the Twelfth Annual Meeting of the Kentucky Pharmaceutical Association, held at Crab Orchard, Ky., May 15th and 16th, 1889. An interesting pamphlet of 96 pages.

PROCEEDINGS of the Pennsylvania Pharmaceutical Association at its Twelfth Annual Meeting, held at Scranton, June 4th and 5th, 1889, pp. 164, 8vo.

REPORT of the Jacksonville Auxiliary Sanitary Association of Jacksonville, Fla., covering the work of the Association during the Yellow Fever Epidemic, 1888. Edited by CHARLES S. ADAMS. Published under the supervision of the Executive Committee of the Association.

A pamphlet of over 350 pages, which contains nothing of value and the cost of which had been better expended in preventing another epidemic.

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